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JOURNAL OF
Wild Life Preservation Society of India

Vol. 10

MAY, 1968

No. 2

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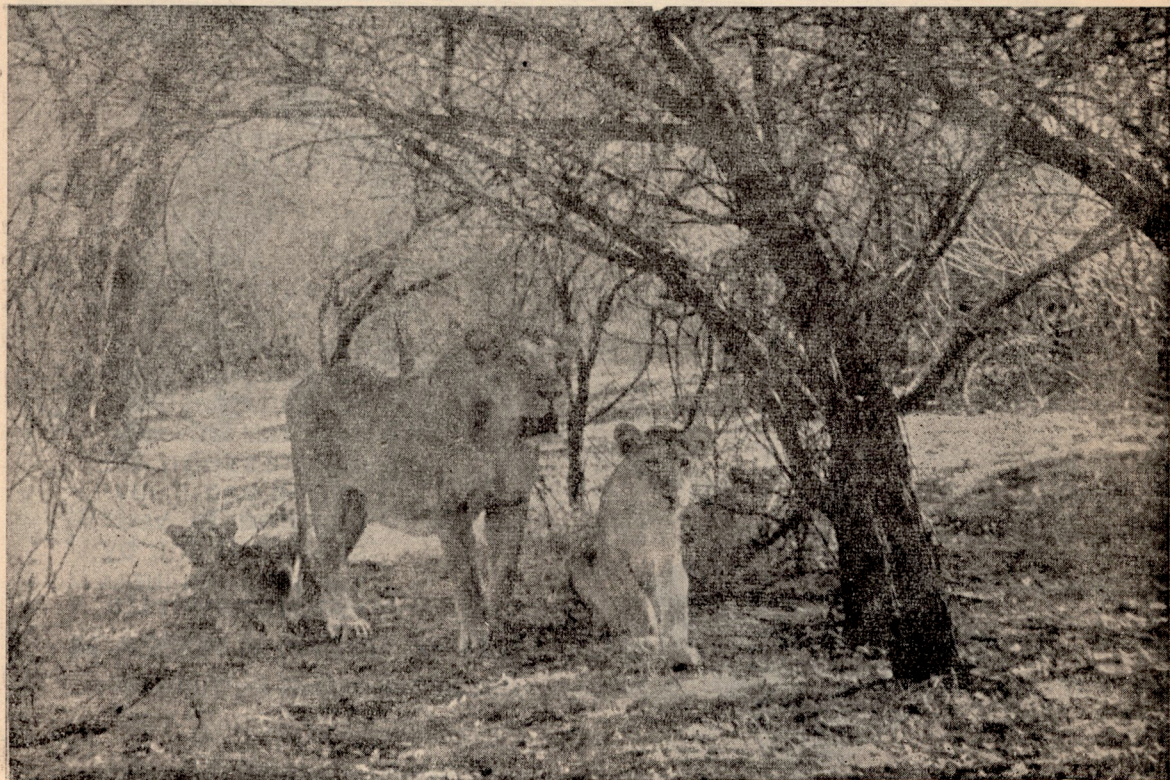
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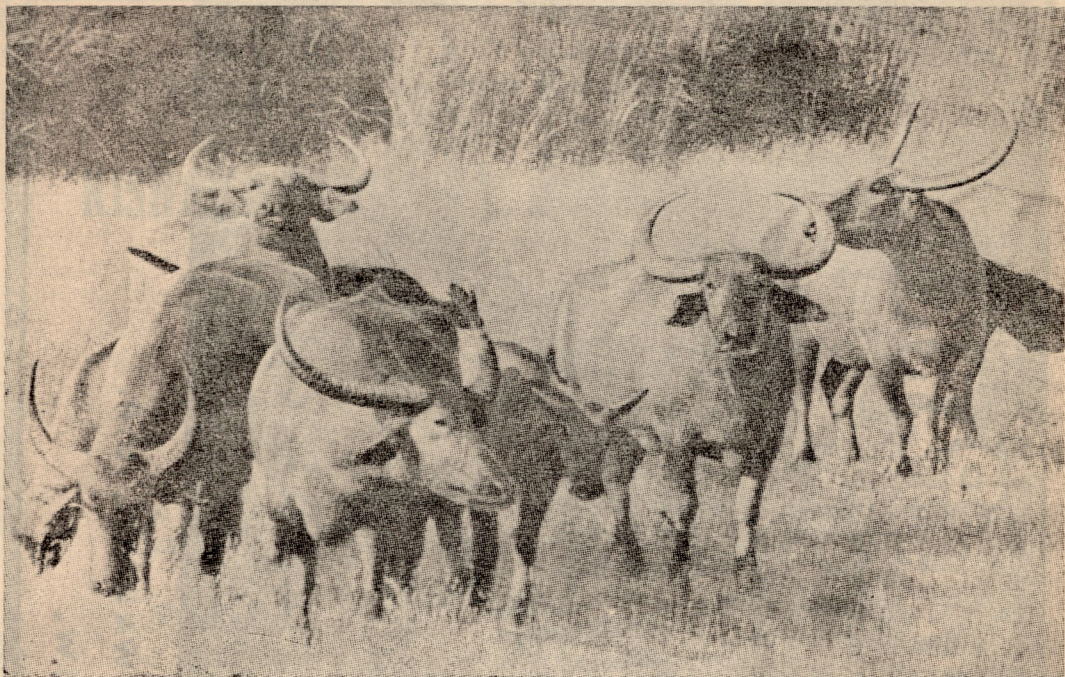
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Presidential Address at the Ninth Annual General Meeting of the Wild Life Preservation Society of India, Dehra Dun, Delivered on the 18th Day of November, 1968

It is a matter of great pleasure for me to welcome you all to this Ninth Annual General Meeting of the Wild Life Preservation Society of India.

The Accounts and Auditor's Report have been with you for some time and may I take them as read ?

The Society has been doing its best to improve the not-too-bright picture of wild life conservation in this country. Dark clouds have silver linings and so will the Uttar Pradesh and Kerala Wild Life Bills, which are on the anvil, when enacted and enforced, go a long way in preserving wild life.

With all the emphasis at our command we submit to the Governments of India and the States that much more has to be done before any results can be expected and it has to be done now for tomorrow will be too late and we may repent at leisure the vanishing of our wondrous wildlife heritage. At present, the various Wild Life Boards, though constituted, do not meet for years and even when they meet to recommend measures, the follow-up action on the part of the Government is often late and lacking. The need of the hour is a declaration of a clear, definite and purposeful Wild Life Policy as a first step and its early implementation by the Government.

I am glad to inform you that we have the honour of having as one of our Patrons, Dr. A.N. Jha, I.C.S., Lt. Governor of Delhi, who has promised to help us in the preservation and conservation of wild life in the State of Delhi.

I am happy to tell you that 2 Patrons, 10 Life Members (this includes 3 transferred from Ordinary Membership), 17 Ordinary Members, 11 Professional Members, 3 Educational Members, 1 Family Member, 64 Student Members and 1 Honorary Member have joined the Society since we met last.

The Society got a letter dated the 20th October, 1966 from Mr. E.I.H. Berwick, Secretary General of the International Union for Conservation of Nature and Natural Resources, Switzerland, asking the Society to suggest the name of an Indian jurist of repute

to serve on the Commission on Legislation of the IUCN. The Society recommended the name of Dr. Nagendra Singh ICS, M.A., L.L.D., D.Sc., D.C.L., Bar-at-Law, Honorary Member of the Society, who is at present the Secretary to the President of India. Accordingly a reply was sent to the IUCN on the 2nd of March, 1967, after getting the consent of Dr. Nagendra Singh. On the 18th of April, 1967, the Secretary and Dr. Nagendra Singh got replies from Mr. W. Burhenne, Chairman, Commission on Legislation of the IUCN at Bonn, accepting the nomination to the Commission. Dr. Nagendra Singh has conveyed his acceptance on the 18th of May, 1967, to the Secretary General, IUCN. My purpose in giving you all the above details is that the Society, which is already an organizational member of the IUCN considers it a matter of great pride and honour that the Society's nomination to the Commission on Legislation of the IUCN has been accepted and now the Society by its member is represented on the top most advisory authority on wild life preservation and conservation of the world. We should all feel proud of this fact.

The Society has been carrying on its advisory, research and educational programme with vigour. The number of Student, Educational and Professional Members is on the increase and this augurs well for the future.

The Society presented a Himalayan Bear cub to Lucknow Zoological Garden and the cub is reported to be doing well.

The foundation of a Film Library in the Society has been laid with the first film "Jungle Fowl of India and Ceylon" in sound and colour, presented by—Dr. N.E. Collias, Professor of Zoology, University of California, to whom we are grateful. The Society also thanks the University of California, Berkeley, for presenting the film.

The circulation of the Society's Journal—"Cheetal" has been growing steadily and it continues to serve the useful purposes of education, research and publicity. Its educational role has been recognised by the Fauna Preservation Society, London, who recently sent in a donation to meet the cost of supplying "Cheetal" for a year to 300 English medium schools in India. This donation was received through the efforts of Mr. M.D. Chaturvedi, I.F.S. (Retd.), one of the active Founder Members of the Society for which the Society is grateful to him.

Mr. M.D. Chaturvedi, I.F.S. (Retd.) deserves all the praise and our grateful thanks for setting a noble example by donating to the Society the entire proceeds of royalty on his book on Panthers which is under publication by the National Book Trust of the Government of India. I hope others will follow his example.

The Society owes a debt of gratitude to Dr. Bains Prashad who has given freely, his valuable advice; exercised his influence in securing a grant from the Government of India towards the expenses of printing 'Cheetal', and secured a donation of paper for two issues of

'Cheetal' from Messrs. Bird & Company to whom we are thankful, and also secured for the 'Cheetal' advertisements worth more than a thousand rupees.

The Society thanks Mr. E.P. Gee for his help and advice freely given, Mr. M. Krishnan, Mr. M. J. S. Mackenzie, Dr. Schaller, Dr. Spillett, D. Collias, Kr. Arjan Singh and others who have been writing for 'Cheetal' and helping the Society in various ways. Thanks are also due to the Chief Conservators of Forests, Bengal, Bihar, Maharashtra, Madhya Pradesh, Assam, for buying 'Cheetal' for their Forest Officers.

My appeal to the Members is that they should do their bit by enrolling members, securing donations and advertisements for 'Cheetal', and thus promote the cause for which we all stand.

I am grateful to the office bearers and the staff, the Executive Committee, the Working Sub-Committee and the Editor. 'Cheetal' for their full co-operation without which we could not have achieved the measure of success that we have.

I thank Mr. R.C. Kaushik, Director of Forest Education and the Principal, Northern Forest Rangers College for permitting us the use of the Forest College premises for holding this Meeting.

I thank all members and guests for making this meeting a success.

The I.U.C.N., Morges (Switzerland)

What is IUCN ?

The International Union for Conservation of Nature and Natural Resources (IUCN) is an independent international body whose membership comprises states, irrespective of their political and social systems, government departments and private institutions as well as international organisations.

IUCN represents those who are concerned at man's modification of the natural environment through the rapid spread of urban and industrial development and the excessive exploitation of the earth's natural resources, upon which rest the very foundations of his survival.

IUCN's objective

IUCN's main purpose is to promote or support action that will ensure the perpetuation of wild nature and natural resources in as many parts of the world as possible, not only for their intrinsic cultural or scientific values but also for the long-term economic and social welfare of mankind.

To further the objective the Union promotes:

AWARENESS through education, so that as many people as possible may understand the value and importance of renewable natural resources and appreciate the need to use them wisely. This includes the dissemination of information through the press, radio, films, and television and through the Union's own publications.

RESEARCH to discover the best measures for conservation and to advance the study of ecology upon which all practical conservation depends.

ASSISTANCE in providing technical data for the conduct of practical conservation programmes.

ACTION on a national and international scale, by enlisting the cooperation of governments and international agencies in support of conservation programmes as well as in strengthening legislation and improving its enforcement.

IUCN Meetings

The Union convenes a General Assembly every third year in order to act upon issues of current importance, and to serve as a forum for discussion of conservation problems. Between 1948 and 1960, biennial general assemblies were held in Fontainebleau (France), Brussels (Belgium), Caracas (Venezuela), Copenhagen (Denmark), Edinburgh (Scotland), Athens (Greece) and Warsaw (Poland).

The next one in 1969 will be held at New Delhi in November.

CHEETAL

Journal of Wild Life Preservation Society of India

VOL. X

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APRIL 1968

{ No. 2

Ourselves

This, the twentieth issue of CHEETAL marks the tenth year of the Society. Before embarking on the problems and the programmes, before bringing you our usual fare of views and news, stories and reports, we would like to place on record our optimism about the future. CHEETAL is here to stay. We have successfully crossed our vulnerable years, and we feel proud to have been associated with all our members and subscribers, contributors, advisers and supporters without whose dedicated honorary work India would have been the poorer for lacking a forum to champion the cause of wild life conservation.

To ensure timely publication and despatch of the Journal, it was decided to delay the dates of publication by one month for each issue; hence, this May issue will be followed by the November issue, instead of the April and October issues. Though members may have to wait another month, they are assured of receiving it promptly.

Though no fanfare will mark our tenth anniversary issue, we hope to make up for this modesty by producing a slightly more attractive issue on the occasion of the General Assembly of the International Union for the Conservation of Nature and Natural Resources, with Headquarters in Switzerland, to be held at New Delhi in November, 1969. We also look forward to subsidies which may help us by then to produce an even better and more frequent Journal.

We hark back in this issue to our debut: In a letter from an illustrious forester who was also a sportsman, and is to-day one of our strongest pillars, we were told:

Appropriately named "Cheetal", this magazine will fulfill a long felt need for a forum for advancing the cause of wild life. It will bring together the sportsmen and the naturalists,

the hunters and the conservationists, and shall I say, the poacher and the preacher of wild life. It will serve as a powerful organ in modulating the game policies of State Governments to the principles of wild life management. In a democratic set up its importance in educating public opinion can scarcely be overemphasized.

“Cheetal” deserves unstinted support of the Forest Departments, as well as of the sportsmen and the conservationists. Forest officers in particular should look upon it as their foster-child and do all they can to nurse it up into a full-fledged journal.

We have been true to our inspiration: Except, perhaps, for the class of outright poachers, the Society numbers amongst its members, and CHEETAL amongst its readership, sportsmen and naturalists, hunters and conservationists and preachers of wild life. We have done our bit to modulate policies to game-management principles, and continue to try to do so. We have tried to influence public opinion. Forest officers are our staunchest supporters now and earlier on. We once again appeal to them to consider CHEETAL their organ, and the Society their own club.

Again, our first editor said in the first Journal:

Our aim is to tackle the problem of India's vanishing wild life from the *public* side. Government committees and boards are all very well, but there are limits to what they can do. The Government of India has repeatedly said that they would like to see wild life societies in the field; and after considerable heart-searching (because there was no under-estimation of the task ahead) the Society was launched on the 14th of April, 1958.

People have asked “what is the use of such a Society and what do we get out of it?” We have heard complaints that the entrance fee is too high, and so on. The very title has been questioned: why Preservation and not Conservation?

These questions reveal failure to understand the motives and the meaning behind all our human institutions. Why does one join the Society for the Prevention of Cruelty to Animals and the Red Cross Society or the Tuberculosis Association? Does life consist only of what we can get out of it, and are our actions to be governed always by the profit motive? Someone has to enter the lists on behalf of wild life. A start has got to be made somewhere. And so we have started.

So we started, and so we are, in the middle of the lists, fighting the good fight, with determination and zeal. With your help, we will win the good fight.

Editorial Notes

The Annual General Meeting:

This is held each year and was held according to schedule after the last issue had already gone to the press. We publish elsewhere the proceedings of this successful meeting but would like to share with our readers the opinion we strongly hold, that more of our out-station members should try to attend the A.G.M. It is at this meeting that the spirit that motivates us is most apparent and most susceptible to the improvements which sharing of views and experiences brings about.

We earnestly request our hundreds of members from far away places to try to attend the A.G.M. meetings and that our President and members would greatly welcome their participation. We would be pleasantly encouraged in our work and it might even be possible to mark the occasion by arranging a trip to the nearby Rajaji Sanctuary. It is merely a question of planning a week-end holiday well in advance, and we will look forward to a more versatile attendance at the next A.G.M., notice of which is sent out well in advance by our Office.

Membership:

Bihar (South): A travelling salesman writes that he borrowed a copy of 'Cheetal' from a friend of his in Calcutta, before boarding the night-train for Barkakana, way out in the Ranchi-Hazaribagh belt. Landed there, he drove to his 'account' at a dam site in the hills where a generating plant is being installed.

He reports that he found such contrast between the precepts of 'Cheetal' and the (mal-) practice of Barkakana that he has decided to become a member of the Society.

While we welcome a new member, we do wish his introduction and induction had been less symptomatic. We are glad to note that Bihar forest officers are subscribing to 'Cheetal', and anticipate great things.

This is just one example of the way in which our membership increases. One member lectured at a large number of schools, 'public', higher secondary and 'private' in 1964 and in 1965, and still never misses an opportunity to speak to school boys whenever possible, to try to gain more student members for the Society. The New York Zoological Society made this member's tour of schools around India possible then by offering him a grant towards the expenses incurred, but such generous encouragement in our effort to induct more members is not to be expected to take the place of our usual uphill task. On that tour scores of student

members joined after the lectures but we found that as soon as we inducted members, so soon did the passage of time lead to a loss of membership, especially so in the student world, where a 'generation' may be only a few short years.

We are convinced that the future of the Society and of CHEETAL rests squarely on the enthusiasm of young people, and the expertise of forest officers and others of the ilk: sportsmen, naturalists, army officers, tourists and so forth. But it is students who can gain most, spread the gospel of conservation farthest and most rapidly. We have one example of a school-teacher who ensures over a hundred members for the Society from his school. Similar efforts are being valiantly made by other schoolmasters and professors and teachers of our acquaintance. It is to the teaching profession that we appeal this time, to enroll their students as members of the Society at the advantageous rates that the Society offers, thus doubly serving the Cause.

Then and Now:

A definition of the village-shikari:

"The Shecarrie is a free occupation open to all religions and classes; though ordinarily its followers are not very remarkable for morality or sobriety. Nevertheless, they seem to possess a certain portion of esteem among the inhabitants around them, and being in many respects useful, are rather protected than discouraged. They are generally excellent in their profession, being good marksmen and expert in various kinds of poaching. They study the habits, and are well-acquainted with the seasons, of every species of game, of which they destroy vast quantities."

From Williamsons' Oriental Field Sports, C. 1820s.

The sportsman, the term as understood in the English language which we are using, however, is an altogether different entity. Even the word 'hunter' connotes a sportsmanlike image, like Jim Corbett or Colonel Meryn Cowie or Donald Kerr of Africa; people who have almost invariably turned out to be sheep in wolf's clothing, shall one dare to say. People who took to sport out of love for wildlife and natural surroundings, an interesting fact illustrated by the recent book, *Elephant People* by Denis Holman, elsewhere reviewed at length.

And is the wildlife photographer NOT a sportsman, even if he never kills 57 elephants? We will wait for another few decades for confirmation, but we expect the answer is that one does not have to shed blood to be a sportsman. Though even to-day, youthful sportsmen will tend to relish more keenly the use of the rifle than the use of the camera. Sportsmen of whatever description, will respect the laws and love the quarry.

Lessons from an Elephant Story:

Elsewhere we publish a review article of a book set in East Africa which describes the sad consequences of effective and dedicated stopping of poaching of elephants for ivory by the Liangulu tribe. We cannot but admire the devotion and energy of the wardens involved in the task, and we cannot, equally, avoid sympathising with their regrets when they find that without the curb of poaching, the elephant population of the Park reached such numbers as to require scientific culling.

Conservation, evidently, would appear to be a sophisticated study, having more than one side to the picture.

Extinction or Survival:

Elsewhere we publish an article on Zoo Management. As we had occasion to remark in the last issue, certain of the zoos in India seem to have made remarkable headway under able guidance and public encouragement. What exercises us here is a letter from Gerald Durrell, well-loved author of excellent and humorous books on rare and exotic animals of the world. Hon. Director of the Jersey Wildlife Preservation Trust he informs us that "Most of the creatures in which the Trust specialises are those whose numbers have been so reduced in their natural habitat that they can no longer cope with the natural hazards of their environment as well as the advancing civilisation. Their only hope is to find Sanctuary in some place where, with an unfailing food supply and freedom from predators—both human and animal—they can build up their numbers."

This makes us think how applicable a similar reasoning is for India to-day. Our *hangul* and *gond*, red bear and ibex, snow leopard and *markhor* neatly fill the bill of the Jersey Trust, and could benefit equally from such urgent assistance. How many zoos in India have these and others of our rare fauna? Very few, indeed, and it is not long before it may not be possible to get hold of the breeding stock that is needed of such fast depleting species as the blackbuck and the bustard. It is time that a programmed drive to build up breeding stocks of our threatened species in ideal environments was investigated carefully.

Migrating Mahaseer:

After a peculiarly unsuccessful week-end spent assiduously fishing a favourite river-junction on the Ganges, we were smoking the pipe of discontent on the suspension bridge above the tributary stream, when our eyes popped out of our sockets, figuratively speaking! There, below us, was a moving, shuffling mass of mahaseer touching each other, hiding the river-bottom, gradually moving down-river. Their scales glinted and glistened in the light of the sun, and we watched entranced, all thought of catching fish forgotten. There must have

been some two or three hundred fish in that school, between five and fifty pounds in weight each. We watched this exciting phenomenon for some three minutes, till they gradually went down out of view. We were joined by more able and experienced, and more successful, fishermen, who told us they had never actually seen the migration of fish, said to take place in end-September in such obvious fashion. These anglers had already spent a week at the junction, and caught some four hundred pounds of fish, ranging from ten to fifty pounds. They had tagged and thrown back several fish under ten pounds.

If only statistical and scientific studies could be made of breeding and seasonal migrations of the mahaseer we would be nearer to a knowledge of their optimum requirements.

Fish Destruction:

Elsewhere, we publish a valuable letter from the noted conservationist, Mr. E.P. Gee, about the explosives which are often used to dynamite fish in rivers and lakes. It is depressing to note that all our efforts, and the awareness of the problem which we have found amongst senior government officers, have not been able to put a stop to the bombing of fish. Even in the case above noted of the migration of mahaseer, we were horrified to find floating down the tributary river, several dead and stunned fish. These had evidently been bombed some ten miles higher up the tributary, where a motor-road crossed it and where such explosives might have fallen into disreputable hands, as per Mr. Gee's letter elsewhere.

The Tiger-skin Market:

The influx into New Delhi of a large number of foreign tourists is always a great encouragement of the tourist activities, of which wildlife observation, hunting et al. The recent UNCTAD conference in New Delhi was one such, and brought about a boom not only in the sales from shops and of visits to Corbett and other National Parks and Sanctuaries but also, and unfortunately, in the sale of tiger-skins and other animal trophies. These souvenir-hunters have hiked the prices demanded by the often unscrupulous dealers to the region of rupees five thousand per skin, with variations. It is estimated that a total of one thousand tiger-skins have been sold in this 'rush' in the last few months. Even if the tiger population be estimated at the upper figure of 5000, this does seem to be too much of a drain for the already disturbed and reduced breeding capacities of tiger, with the habitat shrinking all over.

Would it present insuperable obstacles, one wonders, for authorities to impose control, if not a total ban, on the export of tiger and panther skins, other than those shot by legitimate hunters and procured for trade legitimately. This seems the very minimum that the tiger deserves: In another five years it may be too late.

Amateurs in Conservation:

Our views on the subject are too well-known to need reiteration, but we would like it to be more widely known that the Wild Life Preservation Society has only its Headquarters in Dehra Dun. Branches already exist in Bihar and Assam, and if there is anywhere a sufficiently active group of people ready to shoulder efficiently the responsibilities and do the work of opening a Branch, they should get in touch with the Secretary. What prompts us to write this is a report of the formation in Calcutta of a Wild Life Preservation and Game Association. We congratulate the founders of this, but feel there might, perhaps, be more effectiveness in Branches of an already flourishing Society, than in the often arduous and uphill foundation of new organisations. We offer this in a spirit of humble helpfulness only, and will help other groups to the best of our ability in any case.

WORLD WILD LIFE FUND, Morges (Switzerland)



This is the Symbol of the World Wild Life Fund

A Giant Panda (Ailurpoda melanoleuca) has been chosen to symbolise the work of the Fund because it is one of the best-known and best-loved rare animals in the world, and because it owes its survival to the sort of careful conservation which all wild creatures deserve.

The Gir Lion

By

R.S. DHARMAKUMARSINHJI

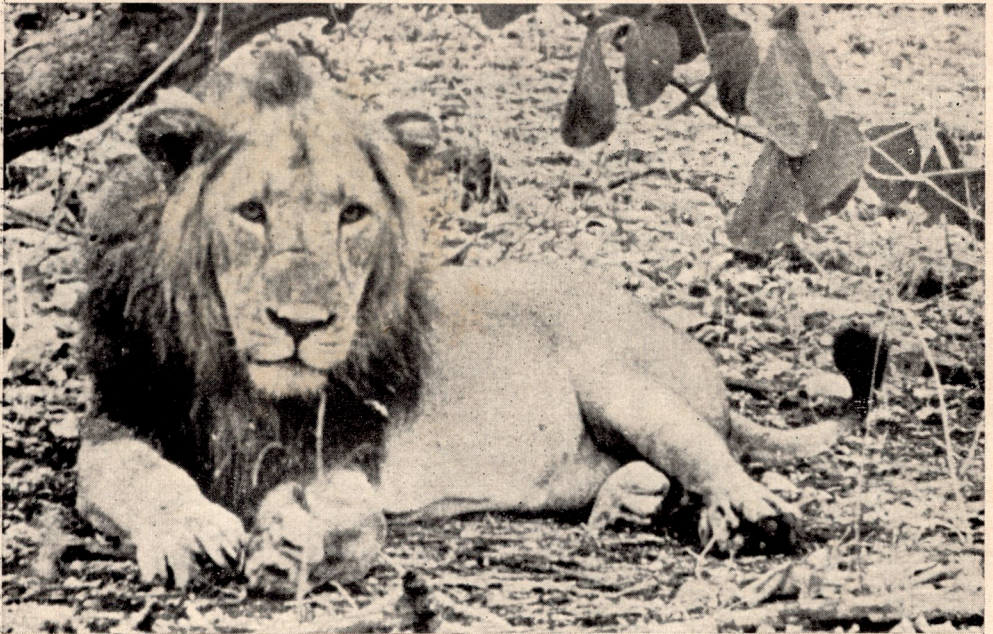
The *Savaj* or *Untia Vash*, or *Sirh* the Asiatic Lion, *Panthera leo persica*, by which names the Gir Lion is called, is now confined to an isolated thorn forest of mixed deciduous type in the Gir forest of Gujarat State in India.

I like to think of this much persecuted and almost exterminated animal, whose distribution reached the shores of Asia Minor on the west almost to Bengal on the east, to what is now a remnant portion of its original distribution, of a few hundred square miles, in the sparsely forested hills in Saurashtra of North-West India, as the Indian Lion, whose symbolic fronts stand at the crest of our National emblem. This animal is no doubt the most important animal in this country today, not only on account of its heritage, bold and dignified appearance, but as an animal recognised throughout the world, not without reason, as the King of Beasts, on which States built their foundations of Power, Equality and Justice. The lion has been depicted prominently in the coat-of-arms of many past and present States. And as a living animal whose courage and fighting spirit have challenged the might of man ever since he has come into clash with him. Until man invented the high velocity rifle and heavy-gun, replacing the keen-bladed hand-made weapons, the lion was very much his own master.

Modern naturalists are apt to draw a different picture of the lion. Having studied the animal in detail and having seen some of his innate weaknesses in character, to me he appears like a glutton and a coward. I am not arguing a case for the defence of the lion, but I do think environmental changes and individual temperament play an important role in animal life. I know it is misleading to attribute human moral values to animal life, but man himself is to be blamed for doing so and not the animal. The qualities of the lion were better appreciated by those who lived up to be lions. Why is there a Lions' Club International and not of Elephants, Hippopotamuses or Rhinoceroses formed by human society?

Much has been written about the Gir Sanctuary but very little about the Gir lion. A common belief in India, even amongst some forest servicemen, is that the tiger came into conflict with the lion and finally defeated and almost exterminated lion. There could be nothing further from the truth. Of the two the lion is the older resident of India, and has a preference for a habitat which consists of open grassland and scrub or dry deciduous forest,

THE GIR LION

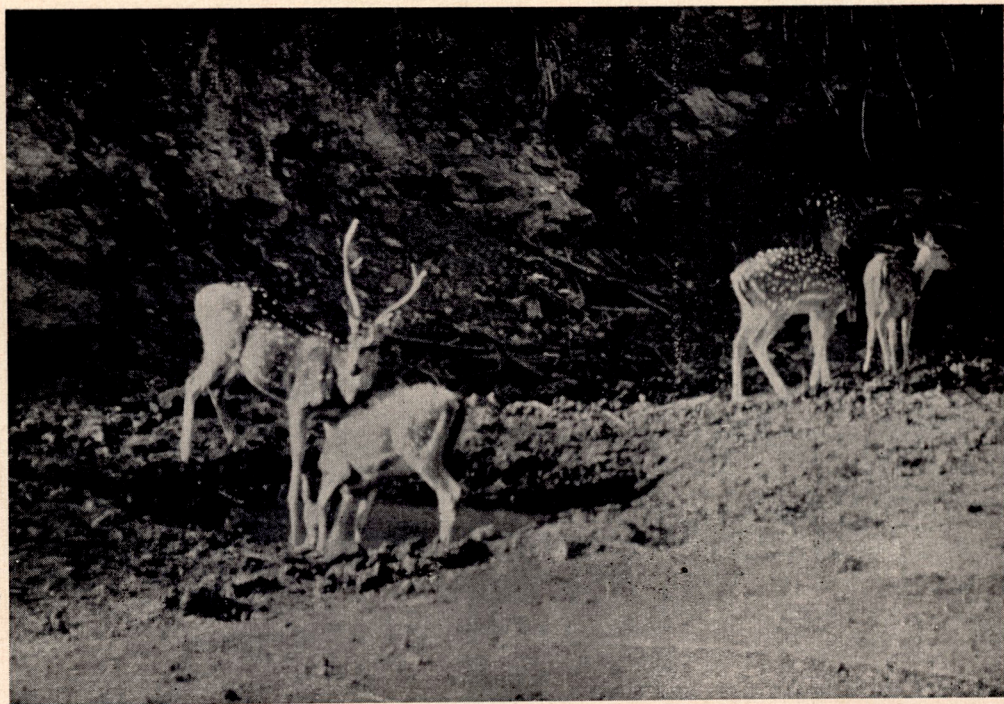


Photos by: Forests Gujarat State

(For reference, see Page No. 8)



Sahastra Dhara Hills.
(For reference, see Page No. 27)



Dear on an artificial watergallery.
(For reference, see Page No. 46)

whereas, that of the tiger varies from dry or moist deciduous forest with tall grass, to wet tropical evergreen forest. It is also found in temperate montane forest of a colder region. The tiger readily takes to water, the lion does not. The tiger never existed in the Gir forest. There is no doubt that the lion came into clash with man and his livestock wherever he was found. Man has done his utmost to destroy the lion. However, this attitude is now fast disappearing and giving way to preservation of the lion for the benefit of tourists and naturalists, who prefer to see the lion alive rather than dead. Fortunately for the Gir lion, this new trend has come to stay and the magnificent Indian lion is alive, and its extinction averted.

The Gujarat lion, according to one Captain Smee, was falsely dubbed the maneless lion of Gujarat, owing to some specimens he saw which had scanty manes. Not all Gir lions, however, have a full mane which is of tawny-rufous or tawny-grey colouration, though some have rich golden-black manes, and are known as 'black maned' lions. The crest is not very well developed as compared with some African specimens but the tail and elbow tufts are thicker and larger.

The Asiatic lion ranged throughout Gujarat in the 19th century taking its last refuge in the Gir, Girnar, Alech, Sihor and Barda hills of Kathiawar (Saurashtra). By the end of the century, he had disappeared from almost all those areas except the Gir and Girnar. Col. L.L. Fenton who spent many years in Kathiawar at that time, shooting lions and panthers, even the Cheetah, was once told by Maharajah Jam Vibhaji of Nawanagar that he had shot lions in the Barda hills in his young days. Later some lions were destroyed after the Vadher rebellion. Since then lions became extinct in the Barda hills but have been found visiting the Girnar hills, near Junagadh from time to time, but owing to lack of natural prey, the lions have not made their home in them.

The Gir forest, therefore, is now the only place in North-Western India where the Asiatic lion thrives. Much of the credit for saving this rare species goes to our National leaders, Nehru, Patel and Prasad, and we should not forget Lord Curzon and the Nawab of Junagadh.

During the erstwhile Saurashtra State, it was the policy to allow four lions to be annually shot by special invitees of the Raj-Pramukh apart from those that were declared cattle-lifters or man-eaters. Then when the Gujarat State was formed, lion shooting came to a stop by government order. Yet, the shooting of a few of the best-maned lions during the former regime did not affect the lion population, which had been steadily increasing. The lion censuses of 1950 and 1955 showed about 219 to 227 and 290 to 310 lions respectively in an area of not less than 700 square miles of which nearly 300 consisted of revenue land. This lion country had at the time reached its full carrying capacity and the lions were wandering out where there was no game for them. The over-population of the lion in its ideal habitat coupled with indiscriminate killing of its main food supply, compelled the lion to prey upon domestic

animals. This critical situation created enormous dissatisfaction amongst the 'Maldharies' (Cattle owners) and they made use of rat-poison to destroy lions causing havoc. Consequently, many lions were destroyed of which little is known, bringing the lion population down considerably, to the relief of the herdsmen. At first, the forest department were reluctant to admit this position, though later, it placed the blame on the criminal traits of the 'Maldharies'. The public should be made aware that, those people living in the midst of Gir forest with the lions for generations in closest amity were now being accused as criminal tribes. True, they did murder lions, only after they had suffered irreparable loss in losing some of their most valuable milch buffaloes and cows of the famous Gir breed, and on which their livelihood depended. Now Poisoning of lions has stopped and compensation is given to herdsmen whose cattle are killed by Lions. Some lions were trapped and sent to the new Chandraprabha Sanctuary in the Chakia forest of Uttar Pradesh, where they have been reported as having multiplied to a number of eleven or more. Recently, the Gir lions are again being reported as increasing, though the figure of 287 estimated by the forest department in 1963 is being monotonously repeated by those in control. None, however, really know how many lions exist in the Gir forest today. The best judges, I would imagine, are the cattle owners or perhaps the forest contractors who roam all over the forest.

At no time in the history of the Indian lion has there been so much fuss made over the lion and attention paid to him in his free state than at present. So long as the lion does not increase beyond his limits, there being no family planning for him, and his food of game well preserved, he will live in comparative safety and enjoy a full life.

Watching lions has become popular with the local people, young and old, and it has been a difficult problem for the forest staff to keep people from trespassing on "Lion Shows" already reserved for those who have paid for them. Nevertheless, the organised seeing of the Indian lion in its last abode has been due to the State Government's policy of affording full protection to the lion, not only as a vanishing species, but to enlist the sympathy of the common man to support the survival of a rare indigenous animal of international wildlife significance and to perpetuate it for the benefit of posterity. Without Government support, backed by a strong public opinion in favour of wildlife protection, the Indian lion would quickly disappear as it once nearly did.

Those who have seen the Gir lion have come to adore him. Hence, any report of a lion found dead soon gets into the local newspapers. The dramatic death of "Teelio", at whose death I was a witness, appeared in all the vernacular papers and even a flowery obituary was written of this magnificent beast, who once filled government coffers with thousands of rupees by displaying himself to visitors for many years. The shikaris who knew this lion intimately,

mourned his loss greatly, more so, because they knew they would not find such a good natured and co-operative animal so easily.

A large amount of credit of the popular "Lion Show" must be given to the forest guards, the hereditary shikaris of the former Junagadh State, without whose co-operation there would have been no "Lion Show". As a boy, I have seen the old *Pagis* (Head trackers) at work, on whose tracking and management successful shikar entirely rested and who could be classed with the world's best Lion-trackers, when lion-hunting was in its hey-day, when the lion knew the game and departed at the slightest noise made by man or turned to attack him when he was at a disadvantage. Shikaris who had tracked wounded lions and faced their charges come to mind. Poona Raja with his scarred face was one, the result of battling with lions and the necklace of medals he wore presented by V.I.Ps., were ample testimony to his bravery and skill. Names of Dosal Jemadar, Dhana, Nan Jemadar, Kheema (all dead) and the now aged Saleh Mohummed come to my mind as veterans of the past. And yet, amongst some of those living, Noor Mohommed Jemadar, Kanthad Jemadar the son of the famous Poona saja, Haidu, and Jumma Sidi the half negro, are still some of the best. The last, an expert sambar shikari, the best I have known, who could jump a sambar stag in his wallow and catch him by his horns. Today, the young lot of shikaris are good but they are not pressed to exert themselves. In truth the "Lion Show" is a tame affair in which the lions have lost the fear of man, thus permitting him close approach. The ease with which lions are shown has been a great advantage and delight to the public, who do not see them in the wild and yet there is with some people a wrong impression, that lions are shown too easily and the animals made too docile. They say, lions should be made of sterner stuff and should be made difficult to see, so that people may feel glad to see such rare and dangerous animals even for a moment. I am afraid, this would not be so satisfying to those who pay to see the "Lion Show" or for tourists coming from distant countries. Furthermore, the habits and behaviour of the lion can be better studied while at close quarters when animals are not afraid, than if they were shy and wild.

Without the assistance of the lion-shikaris, lions would not be so easily seen in the type of forest they live in, cut up by deep ravines and covered by thorny bush or dry teak leaves where approach is difficult without causing alarm and disturbance. The shikaris have become the friends of the lions and not their enemies as in the past. For, Haidu introduced me to a family of lions calling its members by their pet names and pointing out to me one, saying, "I knew that big lion when he was a tiny cub". At another time he took me to two lions sharing a lioness and while I was wondering why the boys were not fighting, he said "Those two are true brothers"! Gir lions are sociable and enjoy community life and it is characteristic to see two lions hunting together and a pride sharing its prey. There have been very stray instances of man-eating lions in the Gir forest.

A Gir lion of good size measures between 8'-5" to 9'-9" between pegs and in height at the shoulder from 38" to 42". One seldom sees lions with full black manes, they are indeed rare in the Gir forest. Nevertheless, the widely advertised "Lion Show" brings many tourists to the forest and is a great success, thanks to the excellent management of the forest department. The Show, however, revolves around a few prides whose old acquaintance with the shikaris is not forgotten and the lions behave in a most rewarding manner and form the Royal Family of Sasan. Their daily engagements are recorded by the forest staff. When a recalcitrant member misbehaves, Mr. Kanthad reprimands him with familiar abuse or threatens him by chucking a pebble at him, with the result that "Leo" is reminded of his infantile days when Tutor Kanthad skolded him while 'Mummy' looked on reproachfully. The Shikari-Lion relationship is close, not enough to produce a Sphinx, but quite amusing, if not ludicrous, to watch, specially if we have not read about "Elsa". What about the other denizens of the Gir forest which form the chief prey of the lion ?

The nilgai antelope, sambar, chital, fourhorned antelope, chinkara, and the wild boar comprise the important prey of lions and panthers of the forest. None is plentiful and little is known about them except by the meat-eating people within the forest and by those who enjoy game meat outside. Much more attention is required to be paid to these valuable ungulates if they are to survive and serve as natural food of the lion. If these animals are allowed to increase, it will not only provide more food for the lions, but will also relieve pressure on domestic animals. Furthermore seeing these game animals gladdens lovers of wildlife, and makes them enjoy their time in the lion country.

The problems in the Gir forest are manifold: Attempts at growing more trees are counter-balanced by man and his livestock. It appears that the forest policy is to thin the forest in order to produce better timber. Eucalyptus trees have been introduced in the sanctuary with no benefit to wildlife but it is hoped that this experiment remains closed or fails to the relief of wildlife conservationists. The Gir game sanctuary needs to be raised to the level of a National Park, managed by a competent Park Superintendent whose main interest would be to see to the welfare of the Indian lion and those who come to see and study him.

It is a pity that serious scientific wildlife conservation has not yet taken root in India, and that forestry is given priority in places where Indian wild life is of greater importance. Most of the Gir lion country produces wood for charcoal and the timber is of poor quality, grass being of much value in supplying fodder to livestock within and without as the average rainfall is higher than in other parts of Saurashtra.

Because of humid wet conditions during the monsoon in the Gir, mosquitoes, flies and other pests cause lions discomfort and as its prey also emigrates under cover of crops, the lion

also follows it into more open country. It is in such conditions that the lion walks into danger of being killed by unscrupulous hands.

The Gir lion is beneficial as a consumer of old and useless cattle. Notwithstanding, the troupl of lions have become so addicted to buffalo meat, that they are a menace to herdsmen, specially during the tourist off-season, attacking their animals fearlessly in broad daylight. Hence it is not surprising that these "show-lions" are the first to take the law into their own hands to the embarrassment of the Forest Department.

There is a German Saying "*The stomach is a bad Counsellor*".

For the Wildfowler—V

By

M. J. S. MACKENZIE

The Pochards of India. (TRIBE: *Aythiini*)

Six related species of mainly fresh water diving ducks compose the Pochard group within the Indian region. One species, *Netta rufina* (Red-crested Pochard) however is less completely adapted to diving than the others and is, therefore, lighter in shape, body less rounded and bill narrower. Thus the genus *Netta*; while the remaining five are placed in the genus *Aythya*. Pochards are near relatives of the dabbling ducks, modified for a more aquatic life and underwater feeding. This affinity is found in their general behaviour and in the colour and pattern of the downy young, which shows they are really far distant from other diving duck such as Eiders, Scoters, Golden-eyes, Mergansers and the White-faced duck, a stiff-tail.

Pochards have a short heavy body, short-tail, big head, long neck and large feet. The legs are set far back and the thumb (hallux) is heavily lobed. Most species walk with difficulty and hold their body up on land. Sexual difference in plumage is always present but none of the females show the streaked plumage found in Dabbling Ducks. There are never metallic mirror colours on the wing, the speculum being white or pale brownish.

Most Pochards are found in the northern hemisphere but four of a total of fifteen live south of the equator in South America, Africa and Australasia. We have six species here and North America has five thus making up a total of fifteen throughout the world. There is some

evidence however that the Pink-headed Duck (*Rhodonessa caryophyllacia*) was also very closely related to this tribe although less specialized than the other members.

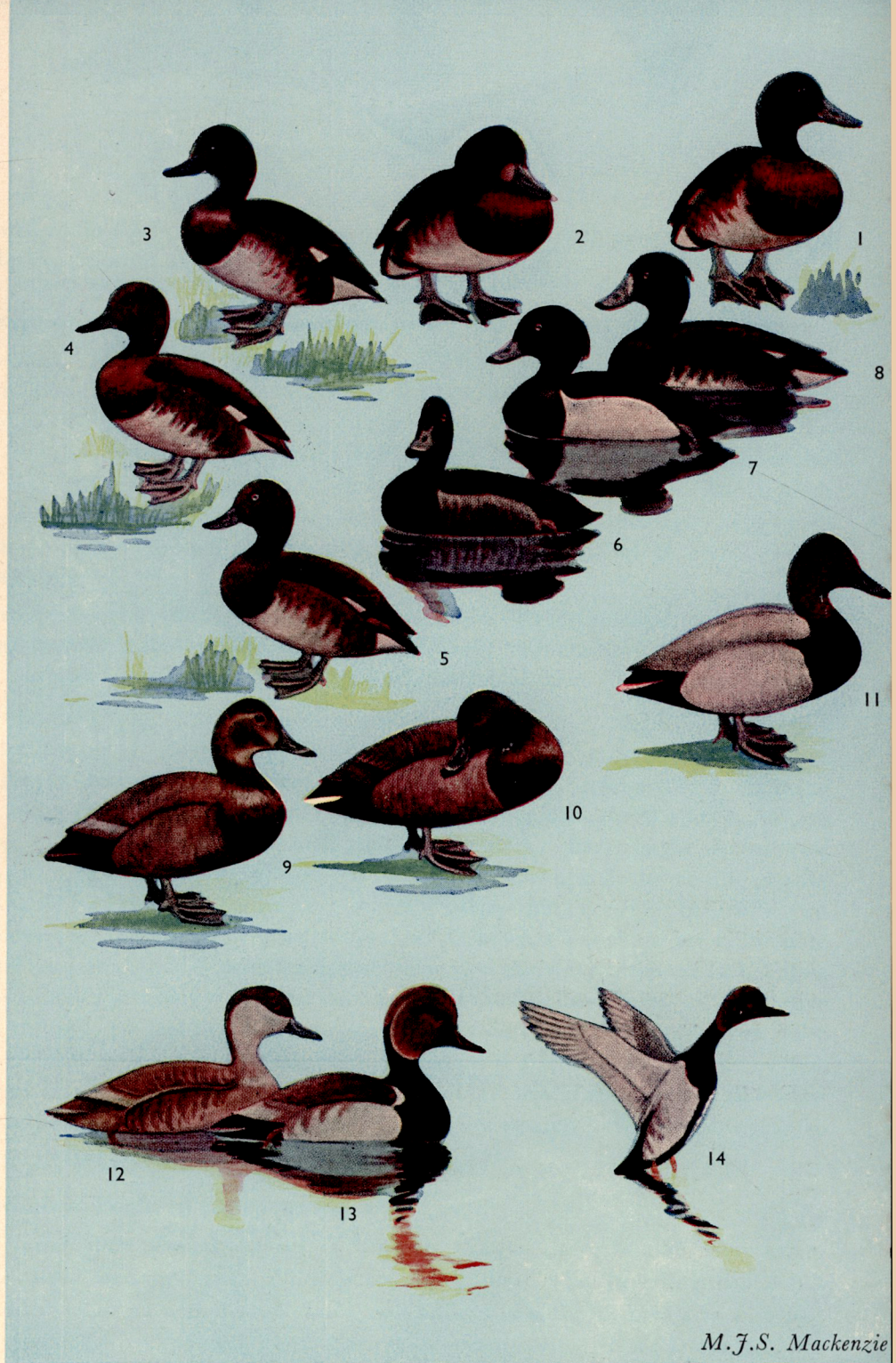
Red-crested Pochard (*Netta rufina*) Figs. 12, 13, 14.

I believe many people have mistakenly described the breeding male Red-crested Pochard as a Pink-headed Duck, and indeed he is a most striking bird but quite distinct from the Pink-headed Duck. Thus any one with even a basic knowledge of wildfowl should not make such a mistake. The head is a bright reddish orange chestnut, fluffed up from the base of the bill over the crown with a rather lighter orange crest. The eye is red and the bill a bright crimson with a slightly lighter coloured nib. Really a most striking head made more so by black nape, neck, breast, belly, back, rump, vent and tail coverts. The sides are white by contrast, with broad brown bars up near the wings; tail grey, wings grey brown with a white patch, often concealed, on the shoulders; a large white mirror on the secondaries; underwing white. Legs and feet orange yellow tinged with black.

The female is a plain grey brown with the crown and sides of the head over the eye a darker brown, the rest of the head and neck pale grey. The under parts are whitish, breast brown, sides bared with brown and back also brown. The eye is a red brown; bill grey but with the edges near the tip becoming pale pink. The male in eclipse resembles the female but the markings are stronger and the eye red. The bill also retains most of its redness which is an easy way to distinguish him from the female at this stage.

Red-crested Pochard are usually found on quiet shallow areas of fresh water or salt lagoons with plenty of submerged vegetation, and they sometimes even graze on land: Usually seen in pairs or small parties but during the later winter they collect into large flocks in some favourable places such as big areas of open water. I have seen this in South Bengal but never in Assam where nearly all suitable water is thick with reeds and weed growth. The male I have never heard call but I believe makes a hard wheezing note almost exclusively in the breeding season; the females on the other hand can be heard at any time having a grating 'karr' much as other pochards. Many people consider this a poor table bird, and probably with good reason but should you find yourself shooting duck well away from the sea shore on any inland waters of India I think you will find any of the pochards quite good enough for the table although never as pleasant as Common teal, Spotbill or Mallard.

Previously I have written about keeping duck pinioned on a pond or tank for interest or decorative reasons. The Red-crested pochard is a very good bird to get into a collection, the drake being most striking. They also have the advantage of being quiet with other birds about and can move and feed on shore unlike our other pochards which are all very ungainly when trying to get about on land. My wife and I also found that Red-crested pochard be-



M.J.S. Mackenzie

THE POCHARDS OF INDIA
(For reference please see Page No. 13)

come tame and will come up for food, etc., very quickly compared with most other wild duck except possibly Indian Spotbill or Tufted Duck.

European Pochard or Common Pochard (*Aythya ferina*) Figs. 9, 10, 11.

The European Pochard resembles the famous American Canvas back but is smaller and darker. The drake has a rich chestnut red-head, black breast and black back. The mantle, wing and sides of the body pale grey white with thin dark grey vermiculations; the wing primaries darker becoming brownish. Tail, rump and vent black with underparts white. The eye is bright red, bill long and black with a bluish grey band across the middle and a distinctly sloping forehead. In eclipse they are much duller, the plumage retaining its colour pattern but strongly mixed with brown, differing with the individual to some extent. Legs and feet dark grey.

The female has head, upper back and breast brown, slightly mottled; the face, chin and a line through the eyes paler almost creamy; mantle finely vermiculated brownish grey; wings dark grey; tail and rump dark brown with whitish underparts. Eye brown; bill like the male and legs grey.

In size the European Pochard is about the same as the Red-crested pochard but of heavier proportions. I think the most noticeable characteristic of this pochard in flight is the length extending beyond the wing; all our other pochards in India are short and stubby, a characteristic most apparent in the Tufted duck and White eyes. Early in the winter these pochards will be encountered singly or in pairs but soon collect forming flocks as the season progresses. As a table bird they are not usually recommended, but I again maintain that you should be shooting up country away from the sea, or salt lakes, all pochard are reasonable table birds. They also make good sport being very strong on the wing although rather slow from the water; but should you only wing your bird you will usually lose him as they dive well being able to feed 13 feet below the surface and stay down for 30 seconds or so quite regularly. They do well in captivity and can easily be fed on grain, etc., with other species. The drakes are quiet handsome but the females rather dull. I would recommend all sportsmen look closely at the eye colour when identifying the females (which have brown eyes) so that out of plumage drakes (red eyes) may be spotted.

Ferruginous White-eye Pochard (*Aythya nyroca*) Figs. 3, 4, 5.

This duck, the smallest of the pochards, is commonly known here as the 'White-eye' and I believe needs little description to Wildfowlers in India. The breeding drake has head and neck reddish chestnut with a small white spot under the chin; his breast is also the same colour but separated from the neck by a narrow blackish ring. The flanks are duller chestnut; back greenish brown and belly and undertail coverts white. The wing mirror is

white with a black band edged with white at the tips of the secondaries. The bill is black grey with a lighter grey tip; legs dark grey and the iris is white.

The female differs from the male in having a *brown iris* instead of white and in being duller. The eclipse male plumage is like the female but the iris remains white. I underline the colour of the female's eye because I have met many people who believe her to be another species because her eye is not white.

Ferruginous White eyes are typical pochards of fresh waters being most usually found in the vicinity of reeds and kugri among which they skulk. They dive well but do not stay under-water very long so prefer to feed in shallow ponds or slow running streams with heavy cover. The drake has the usual wheezy call and the female a harsh quack. In the opinion of some sportsmen they are not strong flyers but I have found them very fair game especially on narrow bheels with high kugri grass where they rise well and fly fast although rather direct. They keep mainly in small companies, seldom in large flocks, the birds being usually by themselves, rarely mixing with other species.

Although these pochards are winter visitors to India many breed as far south as Turkestan and Kashmir and so arrive in the early autumn and are among the last to depart in the spring. I have even seen a few pairs about as late as the end of May feeding along with cotton teal in flooded fields near the Brahmaputra river.

Baer's Pochard—Eastern White-eye (*Aythya baeri*) Figs. 1 & 2.

A very rare winter visitor to India Baer's pochard superficially resembles the Ferruginous White-eye except for the blackish green head and neck of the male and black brown head of the female and eclipse male, but they are larger and heavier; the head is larger, the bill longer and broader and the neck much longer. If seen in life it looks entirely different in shape and in size, about that of the European pochard. The bill is bluish grey not black and the legs are light grey. Again although the iris of the drake is white that of the female is brown.

Few duck are so little known as Baer's pochard. They are reported to go in small companies but I have only seen them in pairs and that only on three occasions. Their migrations seem to vary: some years they are commoner in Northern India while at other times they remain very scarce. They probably resemble Ferruginous White-eyes in their habits but are shyer and wilder rising well off the water, being stronger and faster on the wing.

If collected this species should always be recorded, because of its variety as a winter visitor to the Indian region.

Tufted Duck (*Aythya fuligula*) Fig. 6, 7, 8.

Again this duck will be known to nearly all wildfowlers in India. The Tufted duck is the only member of the pochards with a long crest and is larger than the Ferruginous pochard but smaller than the European pochard. The bill is rather short and very broad. The drake has head, crest, neck, upper parts and breast black; the head glossed with purple. The sides of the body and flanks are white; the belly white flecked with grey and vent black. The eye is golden yellow with the bill grey blue, tip and nail black and a narrow white bar behind the nail. In eclipse the upper parts and breasts are brownish black; sides and flanks pale brown and vermiculated with whitish grey. The crest is renewed in the autumn only.

The female has a much shorter crest and is dark brown with lighter edges to feathers producing a mottled effect. The centre of the breast and belly white; feathers around the bill and the spot under the chin white: Eye yellow with bill and legs grey as in the male.

Tufted ducks frequent fresh waters of medium or large size but like White-eyes like good cover. On the other hand they are often known to visit lakes and ponds in parks and cities when not disturbed. They dive very well, deeper even than European pochard vanishing from sight for long periods; fly well and strongly but are rather slow off the water. They are only partly migratory and partly resident; those breeding in temperate parts merely moving about and gathering during the winter. Their diet is both vegetable and animal and the flesh only mediocre for the table.

Tufted ducks are grand little chaps to have in captivity, the males most striking and handsome and they are very easily tamed being no trouble to feed as long as suitable water is available.

European Scaup (*Aythya marila marila*)

The European Scaup is a large pochard, about the size of Baer's Pochard but marked rather like the Tufted Duck. The head and neck of the drake black glossed with green; breast and tail coverts black or dark brown. The mantle is pale grey, vermiculated with fine black lines; lower breast, belly and sides are white; wing primaries greyish brown, paler in the centre and secondaries the same with a broad white mirror bordered with brown. In eclipse plumage the head is brownish black with an indistinct white mask; the rest of the plumage mixed with brown, although keeping its pattern; the iris is yellow to orange; bill broad, greyish blue with a black nail; legs bluish or greenish grey.

The female is brown with a white mark around the upper mandible much larger than found on the female Tufted duck. Upper parts darker brown and wing coverts vermiculated with grey under parts lighter with pale edges to the feathers. The lower breast and belly

white; wing as in the male; iris yellow to brownish; bill dark grey with a pale bluish area near the tip.

As the Scaup is a rare visitor to India, and probably only to the Western region, I have not illustrated it. However, an easy key to identification from the Tufted duck in both sexes is the lighter colouring of the back and sides, the larger size, and of course the lack of any tuft on the head.

These ducks are generally found on or near salt water gathering in large groups during the day. They are excellent swimmers at sea even in rough weather. They dive quickly and easily and swim rapidly away under water if disturbed, remaining below upto 30 seconds or so. Their flight is fast and noisy but to rise they have to run along the surface a good deal before becoming airborne. Because of their marine habitat they do not make a good table bird any more than the other pochards should they be collected near the sea-shore or on brakish waters.

This concludes the list of the six pochard to be found in India during our winter months. Should anyone collect a specimen of either the Scaup or Baer's white-eye it would be of value to report it to Bombay Natural History Museum or better still send the skin, especially of the latter species of which so little is at present known. I realise that among eclipse drake and the females of this group it is often not easy to differentiate between species without comparisons but every effort should be made by sportsmen to record each species present in their bag accurately. It would then be possible to detect any substantial rise or fall in numbers of any one individual species of the tribe, a knowledge which might easily help you ensure the continuance of your own wildfowling area.

The Courtship of the Indian Porcupine

(*Hystrix indica* Kerr)

By

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The Indian Porcupine (*Hystrix indica*, Kerr.) the largest, blunt-faced, hare-nosed terrestrial rodent of the family Hystricidae in the order of Placentalia Rodentia, closely resembles the common crested porcupine (*Hystrix cristata*) of North Africa, Southern Europe. The general colour is a grizzled, dusky black. The Indian Porcupine also bears a crest and enough horny quills (modified hair) to kill a tiger. But its head and nose are so delicate and vulnerable that a slight blow is enough to kill it. It is found all over India, from the Western Himalayas (8,000 ft.) to Cape Comerin, and Ceylon, Persia, Baluchistan, Syria, Asia Minor and Palestine. In Mysore State it lives in open scrub jungles, deciduous and ever-green forests and prefers rocky hill sides.

Porcupines are often seen solitary or in small parties. They are nocturnal, and come out to feed at night. They sleep by day in caves or rock clefts or in burrows with big chambers. A Porcupine digs its burrows with its powerful paws and stout nails and kicks the dug-out with its hind legs and heaps it at the entrance. It also provides the burrow with two or three "bolt-holes" to make good its escape unnoticed. The bolt-holes also serve as ventilators and permit free circulation of air. In the crop season, porcupines repose in dense thickets near cultivation.

The Indian porcupine is the biggest in size. Head and body 28-35 inches; tail 3-4 inches, with its spines 0-18 inches. Weight 25-40 lbs. It is keen of scent and hearing. Its eyes are so placed that it can look backwards as easily as forwards. But it cannot make out stationary objects beyond 50 yards. It is intelligent and smart and hard to trap or poison. The wild porcupine is so "suspicious" that it scarcely tastes new foods, and this incidentally, makes it difficult to poison it. Poison concealed in an onion or potato is detected and left untouched. This proves that the smelling organ is more sensitive than the eyes. It grunts like a pig and often makes the same noise while charging which it does backwards or sideways with spines erected. It has an odd whim to wail aloud suddenly.

The porcupine has its teeth on the premaxillary and maxillary bones above; mandibles below and divided in the long incisors in the front and the grinding molars behind. The incisors are sharp and chisel-like, usually of yellowish hue. They are used for nibbling and gnawing the food. There are two in the upper jaw and two in the lower. But the wild hares and rabbits bear four incisors in the upper jaw—a larger anterior pair and a smallest

pair set behind them. The incisors arise from permanent pulp in deep sockets, so that they continue to grow throughout the life time of the animal. They do not wear out through long use. Externally they are covered with a facing of hard enamel of yellowish colour on their front surfaces. As the Porcupine gnaws its food the soft dentine of the teeth wears out, while the sharp cutting edge of hard resistant enamel remains. Enamel is the hardest tissue with a high content of mineral salts and their crystalline arrangement. Canine teeth are absent as in all rodents and a wide gap (diastoma) separates the incisors from the grinding teeth. There are four molars or grinders on each side of each jaw, exhibiting intricate grooves or foldings of the enamel on both the internal and external sides. The molars also like the incisors, do grow throughout life from persistent roots. The Porcupine's mouth is adapted to prevent splinters of wood and other inedible things from entering it. The hairy skin of the face extending into the mouth divides it into two parts. In the first or outer division are the incisor teeth, in the second or the inner the molars, and only a small opening joins the two chambers. The cheeks with their hairy lining act as a sieve. Through this sieve finely chopped particles of food get into the inner cavity of the mouth.

The wonderful movement of the lower jaw in the act of gnawing is rendered possible by the shape of the condyle of the mandible and of the squamosal bone of the skull with which it articulates. The condyle lies longitudinally and the squamosal is flat behind it, having no downward (Postglenoid) Process such as is found in nearly all other mammals. The mandible can be freely moved forwards and backwards, thrusting the lower incisors as gouges against the object gnawed as well as upwards and downwards, and to a more limited extent from side to side. Muscles are present for closing the jaw and for drawing it forward and back, while combinations of these produce the rotation.

The skull has a large infra orbital foramen. The muzzle is short and broad. The lip is divided and the ears short and rounded. The anterior feet have four toes and the hind feet five toes, all bearing thick, strong nails. The tongue is rough. The short stumpy legs are seldom seen between the quill boosted body.

When a headlight is flashed on the face of a porcupine at night it rushes to a nearby bush and stands still for a moment. Then with a threatening look it erects all its quills and rattles them together by a quick waving of its tail, at the same time thumping of its feet petulantly on the ground. This rattling of quills evidently expresses its surprise and annoyance and a warning to be away from it. Next, it will let the outspread quills fall back nearly flat upon the body with their points directed backwards. Then again, it looks round its tracks, turns suddenly and bolts away into some other thicket.

Porcupine's quills arise from the crown as a dense crest and they have easily-bent spines, backwardly directed and highly erectile. The crest of quills has no protective func-

tion. The fore part of the body bears 6-18 inches long, thin resilient quills. Underneath these long quills the entire back and sides are covered with short, stout, strong, sharp-pointed quills which can inflict deep wounds. These quills are deep brown or black and white bands. Above the powerfully sinewy tail are the all white quills which are very sharp and dangerous and at the tail-tip are the long, thin stemmed rattling quills which are unlike the other quills. In all, the porcupine has about 30,000 quills. The quills are loosely inserted in the skin, and often, on being vigorously shaken, get detached. The old fable of a porcupine being able to 'shoot, its quills like arrows or darts at a foe, as if it were an ancient archer is quite untrue. It can lash out quickly with its tail and jab many quills in an adversary. If it falls into water, its air-filled quills keep it afloat. If it tumbles down, its quills cushion its fall. Damaged or moulted quills are replaced. A new quill regenerates under the old and dislodges it within a few months.

A rattling tail, the bristling and unbristling of the body quills and puffing grunt somewhat like a pig serve to confuse the enemy.

The easy way of watching porcupines is to sit over their burrows on a bright moonlit night, in an open forest. They roll out of their underground dwellings half an hour after dusk. While coming out they rattle their hollow-quilled tails and the rattling noise can be heard. They then set out briskly in the forest and plantations singly or in pairs or families, puffing and moaning and mewing and occasionally grunting in search of food. Porcupines are herbivores and feed on grains, fruits, tender tips of leaves, mealy tubers, tender bamboo seedlings and also much harder grasses and inner bark and roots of *Bombax malabaricum*, *Boswellia serrata*, *Cassia siamea* etc. They relish the salt contained in the wood. They are very fond of gnawing the roots of *Cassia siamea* plants as the chital (*Axis axis*) are of browsing leaves of Sandalwood plants (*Santalum album*) raised along the inspection paths in Teak and Eucalyptus plantations in Mysore State. But the damage they cause to plants is insignificant. In Uttar Pradesh Porcupines are looked upon as pests. A reward of Rs. 10/- is paid for killing them because they damage forest trees by girdling them. This looks to be a very drastic step till their precise food habits and the extent of damage to forest trees are estimated by the forest department or the wild life staff.

Porcupines sometimes raid gardens and cultivation and cause damage. Their sharp, continually growing incisors and large molars can gnaw and chew anything—it has been seen in the jungle to gnaw elephant's tusk (*Elephas maximus*) soon after its death, dropped antlers of Chital (*axis axis*) and sambar (*Rusa unicolor*) and horns of dead bisons (*Bibos gaurus*. H. Smith) and their bones. Gnawing of food is accomplished by the lower incisors, as hold fasts. Many kills by tigers are obtained near salt-licks where quantities of bones and horns, gnawed by porcupines are found. The entrance of a porcupine's burrow is also often

strewn with bones. The Calcium and lime contained in tusks, antlers and bones help growth of quills. Occasionally rusted pieces of iron also are noticed near the burrow. These pieces also are gnawed by porcupines.

Porcupine has an enormous intestinal sac, the Caecum (lying between the small and large intestines) in which the food stagnates while the cellulose of the grasses and roots and other constituents refractory to the action of the animals own juices are broken down by the enzymes of symbiotic bacteria.

Porcupine flesh has a flavour something like pork. It is much esteemed by tiger (*Panthera tigris* Linn.), leopard (*Panthera pardus* Linn.), and the Gir lion (*Panthera leo Persica* Meyer) and some people. Hanley in Assam has recorded to have seen a tiger digging a porcupine out of a burrow at great speed, flinging in out of the earth in less than two minutes, although he had to dig down three feet to get at it. It is a wonder why that Porcupine did not escape from one of the "bolt holes" of the burrow !

Tiger and leopard are at times mortally wounded by Porcupine quills, which pierce deep into the body of the killer. In the forests dead leopards and tigers have been found with quills stuck in chest, paws, mouth, throat, neck, under the skin of the back, liver and lungs. Leopards, which kill many more porcupines than tigers, catch them by biting their unprotected heads but even so leopards often suffer from quill wounds. A tiger fells a porcupine by a hard hit with its sinewy paw on its head which is so sensitive and vulnerable. The backward lie of the body and back quills make it risky to approach the porcupine from behind without danger of being pierced through. The Porcupine is a pugnacious and agile rodent and fears no enemies. It has an easy defence. It stands still with its head bent and its nose between its forepaws for a moment and turns round and rushes backwards and charges suddenly raising its quills and clashing its hindquarters against the tiger or leopard and flips vigorously its quilled tail and jabs the quills as deeply as possible into his palm, head and nose and fore-quarters and then rushes forward again. The short, solid, white quills with their recurved edges set above its hindquarters strike and get embedded deep in the Tiger's body. This action is performed so rapidly that, in the heat of the battle, as it were, it gives an impression that the Porcupine has shot its adversary full of quills. The tiger cannot easily pull out the quills with his teeth and suffers inexorable pain. Quill-wounds cause crippling disability, thus preventing the tiger from hunting its normal prey. The tiger often becomes a man-eater. In a similar encounter with the crested Porcupine in Africa many a lion turns out to be a man eater, for, crippled by quill wounds, he cannot catch his normal prey. The crippled lion prowls in the vicinity of villages and preys on men until he is shot dead. The man-eating Tigers of Mukteshwar shot by Corbett in an encounter with a Porcupine, not only lost an eye, but was also pierced by some fifty quills in the arm

and the pad of the right foreleg. Many quills after striking a bone had twisted as an U, with the point and the broken-off end quite close together. Pus filled sores were formed where she had tried to pull out the quills with her teeth.

A porcupine was seen to attack a leopard, while both were drinking at the same pool, and drive it out; and another killing a leopard by piercing its quills into his head. Leopards themselves despite their immense strength and agility, are not safe from the attacks of porcupines.

Although there are no close companions among them the porcupines treat one another with mutual tolerance. They have flexible social habits. One day a batch of four or five may move freely together and stay in one of the burrows or dens together; next day two or three or a family party. Many are solitary and like to sleep alone.

After foraging in the forest or a plantation, the male porcupines gather at a place and enjoy wrestling, of course without interference of their quills. They enter into the game if that is welcome. They face each other and stand upright. One of them wheels and suddenly catches the opponent and bites his neck. Then the one whose neck is bitten and held wriggles away and escapes. He is also at the same time chased. The male Porcupines like to challenge their females also, provided the game is welcome. The females play quite a cautious game and do not yield easily to the male members.

During October and November certain internal changes occur in the body of a female Porcupine when she desires to receive a male. She is in Pro-oestrus—the follicular phase or “coming into heat”. She begins to whine in a soft subdued tone. The rutting males also grunt aloud. They fight frequently with each other, but not now with the female. The female in her turn feels restless. She roams about touching or rubbing against rocks, tree stumps or ground and leaving traces of her curious scent of her urethral discharge on them. After she puts her scent on the ground, one of the male Porcupines who happens to pass by picks that bit of earth and smells it. But no male pursues her. They let her alone until she herself beckons that some one of them is acceptable. During the pro-oestrous cycle which precedes the true oestrus some of the ovarian follicles start to grow. The wall of the vagina thickens and the uterus gets ready to receive the embryo. The uterus wall also grows and thickens and it is better supplied with blood. The uterine glands lengthen. The ova in the follicles of the ovary ripen rapidly through the Pituitary gland. Some of the superficial cells of the vaginal epithelium are shed into the lumen. At this stage of the cycle in October the female Porcupine becomes jumpy, active and more frenzied. She goes around dragging a stick, and walking upright or rolling on earth. The male Porcupine too experiences a season of rut, corresponding to the oestrus of the female. In the rutting male the testes, prostrate and other glands of the genital system enlarge and become active. The rutting males have similar solitary diversions for some time. During November the female becomes

quiet and subdued. She does not eat properly. She mopes. She then joins her chosen male and spends her time sitting by his side—But not for long.

At last, the female Porcupine from pre-oestrus reaches the climax of the cycle. She is in true oestrus. During this time ovulation usually occurs spontaneously. The ovum is shed from the Graafian follicle close to the opening of the oviduct. The eggs or ova pass down the oviduct. Now, the time of coupling has set in. Rather surprisingly and suddenly the female Porcupine comes out of her moping mood. She is quite receptive to mating. She takes the initiative. She shows her ardour and willingness to the male of her choice and starts a brief mating interlude. She sniffs him in significant ways. He responds. They touch noses and retreat a few steps, stand upright, walk towards each other and touch noses again. This touch is the signal. She submits in her soliciting posture and the male is atop her. She is co-operative. She flattens her quills and draws her tail over her back so as to enable him to lie on its soft underside. All the same, this is the one supreme occasion when the female has the full control of the situation. She tolerates copulation. The male does not restrain her, as the males of some species do by claspings the females or biting the fur of their necks. Copulation lasts two or three minutes and is repeated during the course of some five hours or so. It may be significant that in this case for successful penetration and sperm liberation the male must mate a number of times. Soon after the copulation the female takes leave of this male. She does not also join other males until her next oestrus. Oestrus or heat coincides with the maximum follicular development and is caused by estrogen.

Among porcupines there is not such an elaborate, prolonged emotional preparation for courting and accepting a male. It is the oestrous female's alertness to wait for the very nuptial day when she happens to be ready to receive the male as her oestrus is of a fleeting duration when receiving the male will result in insemination, fertilization and pregnancy. The sexual mating is achieved by the influence of seasonal changes in the environment in the tropics and the quality and quantity of food available in the region to satisfy the extra needs of the young when they are born. The period of gestation is 112 days. The female Porcupine gives birth to from 2 to 4 young ones having much the appearance of small guinea-pigs in March or April in a nest made of leaves, grass and root fibres in burrow or den. They are lovely little creatures. They have their eyes open when born, and are able to run about at once and reach their mother's four mammae which are situated on the ribs behind the shoulders. At first, their spines are tiny and hairlike, half an inch long, extremely soft and flexible, but they harden in about ten days and sharpen as they grow. The young follow their parents on their hunt for food. Parents with their young ones occupy the same burrow. Porcupines live 10 or 12 years in the Wild State. They can do well in captivity

in a Zoo if their natural habit is maintained. They may breed well and live long. However, they seldom become anything like tame.

'Red' Porcupines with quills of bright rusty red bands, partially or fully have been noticed in the Bababudangiri Hills (Harold Colam 1951). A new species called *Hystrix indica* with orange coloured quills occurs in the Ghat forests of Kerala, dwelling in burrows dug in the laterite rock. The external colouration of quills may be due to an inherent specific peculiarity or to some local variation, and the direct action of particular climate, soil and food. A third species called Hodgson's Porcupine (*Hystrix hodgsoni* Gray) Races in India: *hodgsoni* (Gray), *subcristata* (Swinhoe)) occurs in the Central and Eastern Himalayas, Assam and Lower Bengal at elevations upto 5,000 ft. This Porcupine bears a rudimentary crest. There is a fourth species called Brush-tailed Porcupine (*Antherurus macrurus* (Linnaeus). Race in India: *assamensis* (Thomas)) which is found in Lower Bengal and Assam southwards to Malaya as far as East Borneo and also in West Africa. The Brush-tailed Porcupine is as big as a hare and rat-like in build with a foot long naked tail ending in a curious tuft of withered looking white quills. The body has a fair sprinkling of quills mixed among the brownish fur but the quills do not pierce the body of an enemy. This shows this is a less highly developed type of porcupine than the rest. Its feet are slightly webbed. It lives in swampy places. Its habits are not clearly known.

There are two species of tree Porcupines in North America belonging to the genus *Erethizon*. They are the common Eastern *Erethizon dorsatus* and the Western yellow-haired *Erethizon epixanthus*. They have well developed clavicles and molars with closed non-growing roots. Both the species bear an inch or two long spines concealed in long dense hair. They are robust animals reaching 2½ ft. in length with a stout and clumsy body and broad, flat, blunt, non-prehensile tail. The spines grow mostly on the rump and back of the broad flat tail and their tips are barbed with many reversed prickles. They are loosely attached, and when the animal slaps with its tail some quills may be flung far off. The South American Tree Porcupines (*Coendou*) have long, tapering, prehensile tails, short fur, with white spines and fleshy pads on their hind feet, which aid them to clasp branches of trees. They are nocturnal and feed on the leaves and bark of the trees in which they reside.

References

1. H.S. Prater (1965)—The Book of Indian Animals—The Bombay Natural History Society, Bombay.
2. Journal of the Bombay Natural History Society, Vol. 50, No. 4, August 1952.
3. C.H. Keeling (1962)—Meet the Mammals—George. G. Harrap & Co. Ltd., London.

4. J.Z. Young (1957)—The Life of Mammals—The Clarendon Press.
 5. Reimol Peter Gray (1961)—The Encyclopaedia of Biological Sciences—Reinhold Publishing Corporation, New York.
 6. Cheetal, Vol. 7, No. 2, April 1965—The Wild Life Preservation Society of India, Dehra Dun.
 7. Richard Perry (1964)—The World of the Tiger, Cassel & Co. Ltd., 35, Red Lion Square, London, WCI.
 8. P. Hanley (1961)—Tiger Trails in Assam—Faber and Faber.
 9. J. Corbett (1944)—Man-eaters of Kumaon—Oxford University Press.
 10. Wild Life—Illustrated—Odhams Press Ltd., London.
 11. George C. Goodwid (1964)—Mammals—Ward Lock & Co. Ltd., London.
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It Happened in India:.....

Seen on the parade grounds front of the Red Fort at Delhi: a practising Jain religionist, early in the morning, scattering pinches of precious powdered sugar along ant-trails in the grass, and around ant-tunnels. This, near the Digambar Jain Red Temple and Bird Hospital.

Seen on the main road, in the same locality; A tonga zig-zagging along the traffic lanes, being apprehended by the police constable on duty. The horse was blind and a bag of bones.

Seen, on the same thoroughfare in the evening; a bullock cart drawn by one buffalo, loaded heavily with sheet iron. The yoke was iron, not wooded, and had dug into the buffalo's neck, which was calloused and still bleeding through the thick horny skin of the neck.

Heard, at a lecture by a leading public figure; "And till India legislates against the taking of all life, against the eating of meat and other inflammatory foods, till people stop killing animals in the forest for cruel sport, there can be no peace on Earth."

(Continued from the last issue of October, 1967)

Studies on Biology and Ecology of Common Rock Lizard (*Agama tuberculata* Gray) (Reptilea: Agamidae) in the Doon

By

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Hibernation

Like all reptiles this species also undergoes hibernation but "all lizards (*Agama tuberculata* Gray) do not hibernate" [Dodsworth 1913]. In Sahasdhara Hills observations were made on hibernation and sloughing (being dealt under heading—sloughing) during the years 1962 to 1965, these are presented herewith in Table No. 3 (See Page 28), columns 1 to 12 give the months, each of these columns is divided into two indicating first and second half of the month. Columns of the years are also divided into two—H & S; H gives number of the hibernating individuals while S gives number of sloughing individuals.

From these tabulated observations we find that in the year 1962 Hibernation period spreads from first half of January to second half of February and then it commences from second half of October, and goes up to second half of December. Similarly in the year 1963 hibernating individuals were found in January, second half of October, November, and in first half of December. In the year 1964, individuals in hibernation were found in January; November and December; and in the year 1965 hibernating individuals were found in January and in second half of February, in second half of November and in December.

Thus it appears that the hibernation period is some what irregular but can be concluded from the observations (Table No. 3) that the hibernation period commences from second half of October and continues up to second half of February.

Hibernating individuals appear fraile and inactive, atleast that agility is not present as is seen in non-hibernating individuals, helminth infection in rectum was heavy and some of the individuals were sloughing. It has also been observed in hibernating individuals that the posture is not fixed and appears to depend on inner structure of crevice; it also appears that number of hibernating individuals (refer Table No. 2 in habit and habitat) in an abode is not fixed, and individuals may lie on each other or may cuddle up together.

Table No. 3:—Observations on hibernation period and sloughing during years 1962, 1963, 1964 and 1965. Key to abbreviations H=Hibernation, S=Sloughing, M=Male, F=Female, — — — —>=Hibernation period, - - - ->=Sloughing period.

Months	Jan.	Feb.	March	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Re- marks
Column	1	2	3	4	5	6	7	8	9	10	11	12	13
Years													
1962	H 3M 4F	2F								1M	1M 1F	6M	
	S 1M	2F		2M	1F	2M	1M			1F			
1963	H 4M 2M									4M	4M	4F	
	S 3F			2F						1M	3F	2F	
1964	H 4M 1M 6F										2M	1F	1F 1M
	S			1M	2F						1F	1M	
1965	H 10M 5M 6F	2F									6M 5F	5F 3M	
	S	2F	1F	1F	1M	2F					2M 2F	1F 1F	

Sloughing

Dodsworth (1913) has not made any observations on sloughing in this species and neither Smith (1935) nor Acharji and Kripalani (1935) have observed anything on sloughing in the species. From other published literature also we don't get much information on sloughing in N.W. Agamids, with this view the observations on this subject too were made during the years 1962 to 1965. These are presented in Table No. 3 along with the observations on hibernation period; abbreviation used are same as mentioned over the table.

From the observations in Sahasdhara hills we find that sloughing in the year 1962 commenced in first half of January and continued up to July and later sloughing individuals were found in October. In the year 1963, three females were found in slough in January; two females in April; one male in October; three females in November and two females in December. In the year 1964 sloughing individuals found were one male and two females in April, one female in November and one male in December. While in the year 1965 individuals in slough were found in February, March, April, May, June, November and December.

Thus it appears that sloughing period is also not regular and hibernating individuals also slough. It has also been observed in several cases that the sloughing takes place in parts and is not entire as in ophidians.

Some observations on community density

A survey of Indian literature of last 30 years shows that till today no work has been done on the population studies of any Agamid of north western India. This is the main reason of publishing these observations which were undertaken as sample study to access the feasibility of a detailed population study of lizards to be carried out later on. With this view these observations were made from June, 1963 to November, 1963 in Sahasdhara village proper.

Readings by random sampling were taken in Sahasdhara area south of Balandi stream while readings on basis of walk and spot theory were taken in area north of Balandi stream. Community density was calculated by basic formula— $P = M/V$; where P is density; M is total number of specimens or collected and V is area of the site. Since the average monthly readings comes to two readings—one maximum density and one minimum density, mean reading is difference of the two. Density given is in per square mile area. Age discretion in individuals has not been done instead all individuals seen or collected have been considered in the calculations. (for Table 4, see Page No. 45 of October issue).

From the observations it appears that maximum community density in area south of Balandi stream is in hot months (June) and is 2.25/sq. mile; there appears a gradual decrease

as temperature decreases. It also appears that density is more in area north of Balandi stream. This can be attributed to less disturbances due to human agencies in the area. As in recent years more of buildings have come up in southern area than in northern area.

Thus from these sample observations taken during six months it appears quite feasible that the population studies can be conveniently worked out in this species *Agama tuberculata* Gray.

SEX RATIO

Sex ratio has been calculated on the basis of total number of specimens collected from Sahasdhara hills and the data is tabulated in Table No. 5. Unsexed juveniles and mutilated specimens have not been taken into consideration as other observations (in case of mutilated specimens) on gonads can not be based on such specimens.

From these observations we find that in the year 1963, the number of males from January to December is 6, 10, 12, 16, 17, 15, 15, 11, 10, 12, 4 and 6 while females are 3, 4, 6, 10, 10, 9, 13, 10, 5, 4, 3 and 1 respectively in each month. In the year 1964 also the number of males (5, 8, 8, 8, 12, 19, 19, 11, 9, 9, 2 and 2) as against females (3, 4, 4, 6, 8, 10, 12, 9, 7, 5, 2 and 1) is higher. The same observations appear in the year 1965 too where males (15, 7, 9, 10, 12, 14, 15, 19, 7, 6 and 3) are more than (6, 5, 8, 6, 8, 11, 10, 7, 3, 3 and 5) females.

Thus it appears reasonable to observe that the ratio of males is higher than the females. Acharji and Kripalani (1952) have also observed that there is great preponderance to males in proportion to females. In my opinion this (lower No. of females) appears to be the reason of competition in males [males acquire a territory before breeding (Harriss, 1957) (Chapman and Chapman, 1963)] during breeding season. But the competition does not appear to exist once the individuals have mated (refer Table No. 2 in number of occupants in an abode), However on the average the higher ratio of males over the females continues to have the same trend. To conclude on this aspect it is felt very desirable to say that detailed collaborating studies on sex ratio and behaviour of the male and female individuals can only lead us to any final result and future workers should concentrate on this aspect also.

Food and Feeding Habits

Casual observations on food and feeding habits in the species have already been made by Dodsworth (1913) and by Acharji and Kripalani (1952). The observations presented herewith were made during the year 1964 in Sahasdhara hills and findings on type of food consumed are on the basis of gut content analysis. Identifications of the insects could not be done up to specific level, as they were usually found distorted and broken. However, care was taken to identify wherever possible. The observations are tabulated in the Table No. 6, total food types found are shown oblique to the number of individuals in which it has been found.

Table No. 5

Giving total number of male and female individuals except juveniles collected during the years 1962, 63, 64 and 65 (vertical columns 2 to 5 and 6 to 9 respectively) given against each month (horizontal column 1 to 12) from January to December.

Months	Males				Females				Remarks
	1962	1963	1964	1965	1962	1963	1964	1965	
1	2	3	4	5	6	7	8	9	10
Jan.	7	6	5	15	—	3	3	6	
Feb.	2	10	8	7	2	4	4	5	
March	—	12	8	9	—	6	4	8	
April	2	16	8	10	—	10	6	6	
May	—	17	12	12	1	10	8	8	
June	2	15	19	14	—	9	10	11	
July	1	15	19	15	—	13	12	10	
Aug.	—	11	11	19	—	10	9	7	
Sept.	—	10	9	7	—	5	7	3	
Oct.	1	12	9	6	1	4	5	3	
Nov.	1	4	2	—	1	3	2	—	
Dec.	6	6	2	3	—	1	1	5	
Total	22	134	112	117	5	78	71	72	

We find, from these observations that the main food is insects but spiders and flower petals are also eaten. Acharji and Kripalani (1952) observed that "no vegetable matter could be traced". But here the consumption of vegetable matter could not be taken as accidental. I have seen individuals biting or nipping petals of Dahlia and Zenias, in the morning time and never in "day time" as has been observed by Dodsworth (1913). Feeding of hairs (in January) and cloth bits (in June) appears to be accidental only.

In feeding habits *A. tuberculata* appears to differ from. *A. melanura*, which "feed on vegetable matter only"—Ingoldby (in Procter, 1923). Individuals of *A. tuberculata* were never seen feeding on insects or plants, they were seen feeding insects from grasses near watery ditches and stream banks. *A. agilis* ["never leaves ground"—Blanford (in Smith, 1935)] appears to be similar in feeding on ground.

Table No. 6

Showing type of food found in number of individuals in the year 1964 during the months of January to December.

Month	Jan.	Feb.	March	April	May	June	July	Augu.	Sept.	Octr.	Novr.	Decr.	Remarks
Total specimens examined	8	12	12	14	20	29	21	16	14	9	4	3	
Column No.	1	2	3	4	5	6	7	8	9	10	11	12	
Contents:—													
Invertebrata													
Annelida	*	*	*	*	*	2/3	4/6	2/1	*	*	*	*	
Arthropoda													
Diplopoda													
Millipede	*	*	2/4	1/5	*	2/6	3/1	2/1	*	*	*	*	
Chilopoda													
Centepede	1/1	*	*	*	1/2	*	*	*	*	*	*	*	
Insecta													
Orthoptera	6/5	2/4	2/4	10/5	4/6	10/9	3/7	7/5	3/2	3/2	1/2	10/2	0 ₁
Dermaptera	4/5	*	*	4/6	2/1	3/1	*	*	*	*	*	*	
Isoptera	*	*	7/5	3/6	1/2	2/3	*	*	*	*	*	*	
Hymenoptera	2/5	4/6	4/6	3/6	5/6	3/10	1/3H	3/2	1/1	1/1	*	1/1	
Coleoptera	7/4	10/6	7/1	10/5	10/5	10/11	4/6	1/1	2/10	5/6	1/4	4/1	
Odonata	3/3	5/5	3/2	2/5	1/1 ⁰²	4/6	*	*	*	1/1	1/3	*	0 ₂ =
Lepidoptera	1/2	1/1L ¹	2/1	1/1L ²	2/4	*	2/2	*	2/6	*	*	*	L ₁ =

(Contd.)

Column No.	1	2	3	4	5	6	7	8	9	10	11	12
Arachrida												
Araneae	1/5	2/3	*	1/1	1/2	*	*	3/2	4/9	*	1/1	3/1
Insect Larvae	*	*	*	4/5	*	*	3/2	*	*	*	*	*
Vegetative Flower petals	*	*	3/4	*	4/2	*	3/2	*	10/7	*	*	*
Wild berries	*	*	3/4	*	10/4	*	*	*	*	*	*	*
Miscellaneous												
Hairs	*	*	*	*	*	B/1	*	*	*	*	*	*
Cloth bats	*	*	C/1	*	*	*	*	*	*	*	*	*

B=Small bunch
C=Cloth Bit $3 \times 2m$

Biological Association

No biological association was seen in this area in *Agama tuberculata* Gray. But Acharji & Kripalani (1952) have observed biological association of *A. tuberculata* and *A. argorensis*, they have observed that "both *tuberculata* and *argorensis* were collected almost in the same locality, alt. 3,300—6,200 ft. They were found to live under the same ecological conditions with the same type of food habits. The gut contents of both the species showed that mostly insects were eaten. No vegetable matter could be traced. They were heavily infected with nematode worms *Thelandros baylisi* Chatterji."

Breeding

It was observed in Sahasdhara hills that the individuals have a courtship period which starts with males having a territory first. During this acquirement of territory [observed 3 M and 3 F on 11. 5. 63; 1 M and 1 F on 23. 8. 63; chasing each other on 23. 8. 63] individuals often have a sort of fight and chasing may also be for the females. It is this action in which often the tail is nipped and often there is a change of abode. Similar observations that "males acquire a territory before breeding" have been observed in *Agama agama* by Harris (1957) and by Chapman and Chapman (1962) that "the combatants lie side by side and lash each other with their tail" is not seen in *A. tuberculata*. In *A. tuberculata*, although a good number of male and female individuals have been found with "stumpy tails and regenerated tails"—Dodsworth (in Acharji and Kripalani, 1952). It has been observed that tail is nipped off during the chase, being nearest to the follower.

Male individuals after acquiring a territory ("males don't breed if they don't have a territory" [Harris (1957) in *A. agama*] have often been seen raising their heads, make a chirping noise, which seems to attract in females. Females have been seen in June, responding in same way to males. After this display (Photograph No. 4) and courtship behaviour, individuals mate, copulation takes place in characteristic way and seems to last 3-7 minutes, then the individuals separate. While separating the hinder parts of males often remain lying on the female. Copulation has been observed (in May, June and August) and may be from both sides of females, clasping is by the fore limb on neck or the flanks little behind the fore limb. Hind (Phot. No. 5) limbs are often used in clasping on tail or on hind limbs of the female.

Observations on growth and maturity of testes and eggs in oviducts were made in the year 1963 and have been tabulated in the Table No. 7. From these observations it appears that average size of testes is 3 mm and maximum size reaches to 13 mm in months of May and June. Testes remains fairly swollen during all the months of years suggesting that the breeding season is irregular but the main breeding season is between March to August. In *Agama agama*, Marshall and Hook (1960) found "that males were in reproductive

readiness throughout the year", Chapman and Chapman (1962) have also observed same in *A. agama*. The developed size of testes in *A. tuberculata*, from 5-13 mm in a year also suggests the same probable reproductive readiness throughout the year. In case of females we find that the eggs are 1 mm in February, there is a increase in size up to maximum 10-20 mm in June. This is probably the egg laying period. Acharji and Kripalani (1952) have also observed in two specimens collected in June, on road Naggar to Manali, they observed "with 10 and 6 matured eggs, size varying between 22×11 mm to 20×12 mm and were ready for expulsion". In Dun Valley, specimens with eggs length size 3 to 10 mm have been found in September and October also, suggesting that the egg laying is also irregular and extends from April to October. In Dun valley number of eggs in individuals is variable and 13 eggs have been found in a specimen collected in June.

Four gravid females were collected (3 in May and 1 in June), during the year 1964 to observe egg laying in laboratory. The individuals were fed on insects collected from grassy patches by sweeping of insect collecting net. Freshly collected lizards don't feed in the early period of caging. After, some times they start feeding. All individuals do not lay eggs in cages, out of four gravid females only one laid the 10 eggs of 22×11 mm size in the artificially made crevice in the cage. It could not be observed at what time and how the laying is done. Incubation of eggs was done under a table lamp of 25 watts. Eggs were incubated for 31 days. In hatching head comes out first. Often shell cracks and the individuals remain in the shell for about 30 minutes or so before finally coming out. Eyes are not open in freshly hatched individuals. After 48 hours the individuals moved up on the stone.

Table No. 7. Showing length in mm size of testes; size of eggs in oviduct and number of eggs found in dissected specimens, shown against months, January to December.

1. Months	1	2	3	4	5	6	7	8	9	10	11	12
2. Testes	3	8	8-11	11	8-13	12	9	9	—	5	6	5
3. Eggs in oviduct	—	—	2-6	4-8	6-18	10-20	—	—	5	8-10	—	—
4. No. and matured eggs	—	—	—	8	10	13	—	—	—	7	—	—

Acknowledgement

The author wishes to express his gratitude to the Director, Zoological Survey of India for kindly suggesting the problem and to the, Officer-in-Charge, Northern Regional Station, Zoological Survey of India for extending necessary facilities to carry out the investigations. Thanks are also due to Dr. J.C. Tripathi, Zoologist, N.R.S./Z.S.I. and Dr. A.N. Bhatnagar,

Prof. & Head of the Deptt. of Zoology, G.R.R. College, Dehra Dun, for their constructive criticism and valuable suggestions in the preparation of manuscript.

References

1. Abel Erich (1952)—*Zool. Anz.*, Vol. 158, pp. 1-12, 3 pls.
2. Acharji, M.N. & Kripalani, M.B. (1951)—*Rec. Indian Mus.*, Vol. XLIX, Pt. 2, pp. 175-184.
3. Anderson, John (1872)—*Proc. Zool. Soc. London*, pp. 371-404, text figs.
4. Annandale, Nelson (1904)—(*Lacertilia*, pp. 151-55, pl. VI) *Rec. Indian Mus.*, Vol. I, pp. to
5. Blanford, W.T. (1878)—*J. Asiat. Soc. Bengal* (2) XLVII, pp. 125-31.
6. Chapman, B.M. & Chapman, R.F. (1962)—*Proc. Zool. Soc. London*, Vol. 143, Pt. I, pp. 121-132.
7. Conant, R. (1951)—*Copeia*, 1951, pp. 79-78.
8. Dodsworth, P.T.L. (1913)—*J. Bombay Nat. Hist. Soc.*, Vol. XXII, pp. 404-5.
9. Fitch, H.S. (1951)—*Herpetologica*, Vol. 1, pp. 77-88, figs.
10. Gray, J.E. (1853)—*Ann. Mag. Nat. Hist.*, Vol. XIT. Pt. 2, pp. 386-392.
11. Günther, A. (1860)—*Proc. Zool. Soc. London*, pp. 148-75, 4 pls.
- *12. Harris, V.A. (1957)—Ph. D. Thesis, University of London.
- *13. Houston, Richard C. and William Long (1951)—*Sierra Club Bulletin*, Vol. 40, pp. 1-17.
14. Ingoldby, C.M. & Procter, J.B. (1923)—*J. Bombay Nat. Hist. Soc.*, Vol. XXIX, pp. 117-130.
- *15. Leviton, Alan Edward, George Sprague Myers & Lawrence Wesley Swan (1956)—*Occasional papers of the Natural History Museum of Stanford University*, No. 1, 18 pp.
16. Lawrence, W. Swan & Alan E. Levitan (1962)—*Proc. Colifornia Acad. Scin.*, 4th Ser. Vol. XXXII, No. 6, pp. 103-147, 4 figs.
17. Marshall, A. J. & Hook, R. (1960)—*Proc. Zool. Soc. London*, Vol. 134, pp 197-205.
18. Neill, W. J. (1956)—*Copeia*, pp. 123-124, figs.
19. Prasad, B. (1914)—*Rec. Indian Mus.*, Vol. X, pp. 367-69.
- *20. Pulunin, Oleg. (1951)—Cambridge University Press, pp. 242-265.
21. Smith, Malcolm, A. (1935)—The Fauna of British India including Ceylon and Burma. Reptilia and Amphisia, Vol. II, Sauria, pp. 1-425.
22. Smith, Malcolm Arthur, (1951)—*Ann. & Mag. Nat. Hist. Ser 12, Vol. 4*, pp. 726-728.

23. Smith, Malcolm Arthur & James C. Battersby (1953)—*Ann. & Mag. Nat. Hist., Ser. 12, Vol. 6*, pp. 702-704.
- *24. Swan, Lawrence Wesley (1961)—*Scientific American, Vol. 205*, pp. 68-78.
25. Swan, Lawrence W. & Alan E. Levitan (1962)—*Proc. California Aca. & Sci., 4th Ser., Vol. XXXII, No. 6*, pp. 103-147, 4 figs.

N.B.:—References marked * asterisk have not been seen.

And How They Do It Elsewhere.....

Pakistan has announced plan to set up a sanctuary to preserve the ibex and the markhor between Skardu and Astor, in Gilgit valley. The tribals of this region are well-armed and non-vegetarian, and there is danger of extinction of these two species of goat.

At the University of Rhode Island, in the U.S.A, they have developed and successfully used what is called wildlife telemetry, following up animals and birds after 'bugging' them with tiny radio transmitters. These are then tracked on charts and screens with portable models of receivers, and data on migration, seasonal and diurnal movement etc. gathered and put to good use.

Such methods could very effectively and usefully be employed on tiger in India, as well as in many other ways in wildlife investigations.

A. Imam's Account of the Slaying of the R. Uddayagiri Man-Eating Tiger

The R. Uddayagiri area of Orissa lies in the mountainous region of the Eastern Ghats, with valleys around 2,000 ft. and ranges going up to 4,500 ft. above sea level. In this area the primitive form of agriculture known as shifting cultivation is largely in force. The tribal people of the area fell a piece of jungle, burn the felled timber, and then plant a crop of beans and millet. After a few years the cultivated area is abandoned and new clearings on the steep hillsides made. These areas so cultivated are known as 'podas'. The old 'podas' are soon overgrown with dense bush, and make at most times of the year excellent covert for a tiger to lie up in—'Rehan' is the Hindusthani word for a covert in which a tiger will lie up as distinct from mere jungle in which a tiger will hunt and kill. It needs a practised eye to discern a 'Rehan', just as an unsophisticated tribesman would be unable to distinguish between bed and dining rooms in a modern dwelling.

Since 1959 a scourge in the form of a man-eater descended on the area. Some hundreds of lives have been lost since then, perhaps as many as 500 and over a dozen villages evacuated. Killings would be more frequent in the winter months when harvesting on the 'podas' on steep hillsides in the jungle would be taking place.

I spent May and June, 1965 fruitlessly hunting the man-eater or man-eaters. It seemed that a large male and a female, moving generally separately but with a largish cub, ranged the Nadimutha and Chelagada valleys, naturally including in their territory the steep ranges embracing these valleys. There had been several villages on these ranges but by mid-1965 over a dozen of them had been evacuated due to man-eater havoc.

I noted one curious fact. No killings occurred on roads and footpaths *and killings were restricted to places within easy sortie distance of a 'Rehan'*. Thus the Chelagada valley always had a spate of human killings during the 'poda' harvesting season as the very 'podas' involved over and over again were all within striking distance of a 'Rehan'. In fact in order to locate a 'Rehan' I merely ascertained the site of a human kill in the past and sure enough close by the 'Rehan' was there. The Nadimutha valley on the other hand had regular human kills round the year, the affected villages being within reach of a 'Rehan' in each case. Yet the tigers ranged both the valleys and also the Mohna area to the north. The mohna area is largely Reserve Forest with limited 'Podas', and limited brushy cover for 'Rehans' near villages or cultivation. This went hand in hand with limited human kills in the area, only about 8 for 1965. All this pointed to the fact that the man-eater/eaters did not normally hunt in the day by cruising the jungles tiger fashion but lay up as

normal for a tiger in a 'Rehan' during the day, only making a sortie for a human kill when such opportunity was conveniently at hand to the 'Rehan'. This indicated *great caution* on the part of the man-eater/eaters. It seemed unlikely that two man-eaters would have the same habit of operating in the day only from 'Rehans', and the number of lives taken notwithstanding I believe only one tiger was involved. Time will shortly tell whether I am right.

The second curious fact was that notwithstanding the fantastic number of human lives lost, the man-eater was cautious to the point of timidity at times. Several human lives were saved just because the killer stalked its victim, rushed him unawares and then after actually holding him down with its mighty paws left the victim otherwise unscathed, apparently changing its mind at the very moment of killing. I met at Balusahi, in the Chelagada valley, a man who had gone through this very experience.

Towards the end of June, 1965, some days after an abortive beat for the large male tiger, it was found to return to the old kill and my younger son Christopher sat up over a live bait not far from the kill, which was then removed. The tiger came, rushed the bait, clawed it lightly while it was in its terrible embrace, and then leaped away without doing further damage. This cautious timidity pointed to the large male in the area being the man-eater. Further, this animal had the habit of working an area back and forth for days before going off on its normal tigerwise beat, while the pattern of human kills also pointed to this very characteristic. I was satisfied that this large male, an old animal by its splayed out toed pugmarks, and about 10 ft. in length if the pugmarks were any evidence, was the man-eater. This animal had another curious habit. It would knock down a sapling and apparently get astride it and rub off hairs from its belly on it. This seemed to indicate to a surface irritation on the belly.

As my 1965 summer hunt was abortive, I booked Mr. and Mrs. Alida Sverdsten, of Cataldo, Idaho U.S.A., for a December, 1965 hunt for the man-eater. I warned my booking agent, Lee Birch of Cleveland, Ohio, that this would not be the usual tourist tiger hunt. A jeep would just make our base camp, and thereafter footlogging up steep mountains would be the order of the day, and extreme toughness would be required, though our camp would have all the amenities expected during a commercial hunt. Ed and Alida, as events will show, more than made the grade.

I am a believer in hunting tiger by beating. I know this tiger had been vainly hunted by sit-ups over kills for many years, but reckoned that his very caution would be his undoing if trapped in a beat. The tribals of R. Uddayagiri have no experience of tiger beating. But in a tiger beat the planning of the beat is all in all, and even poor execution of the

beat itself is not the bar to success that the inexperienced might think. To this end I brought my crack Santhal shikari Sanjlu from Hazaribagh to the area in November, 1965 for the choosing and preparing of the beats. The preparations were to include previously erected 'machans', cutting of shooting zones in the brush, and cutting of 'stopping' lines. For 'stopping' I use hundreds of yards of flags on rope, like large bunting, and when the flags give out then we place men on trees as 'stops'. I believe no tiger will face my flags.

11 beats were chosen and prepared, all on steep mountainous slopes, 1000 vertical feet being not uncommon. A mountain beat is actually easier than one on level ground as the tiger's line of retreat is obvious in steep places.

My camp was established at Chelagada and on 21.11.1965 at 8 A.M. a woman was taken by the man-eater on a 'Poda' within view of my tents. The pugmarks revealed it to be that large, old male tiger. So now I knew that he was one of the man-eaters, probably the only man-eater. On 26.11.65, a man was killed at Ghorapadar, some 6 miles as the crow flies from my camp, but almost a day's march over those mountains. On 2.12.65 a man was taken at Tendiguda, again only a few miles from my camp but a day's march away. On 5.12.65, a woman was killed at Kanikpadar, 2 miles from my camp. The pugmarks showed the killer to be the large male tiger. On 6.12.65 two brothers were killed at Putosahi, 2 miles from my camp. At the scene of the killing we found hairs rubbed off by the tiger onto a rock from its belly, the habit of that old, large male. On 9.12.65, my clients arrived and our hunt was on. 11 bait were out for the beats, and 1 for a sit-up. On 11.12.65 a man was killed at Librigoda, 6 miles from my camp but a day's march away. On 13.12.65 a woman was killed at Pushpang, again 6 miles and a day's march from my camp. Some local shikaris sat up over the kill, with no luck as usual. This tiger was much too wary for a sit-up. On 19.12.65, a woman was killed within view of our tents at Balusahi, but we were at the time some miles away at the scene of a leopard kill, and by the time we marched back to Balusahi the body had been recovered and was being cremated. On 21.12.65 there was a kill of a village buffalo at Ranelay, again by the big male tiger, and Alida sat up over the kill with my shikari Sanjlu, with no luck as usual for sit-ups. On 22.12.65 a man was killed at Nadigama, some miles from our camp, but the news reached us only later. On 23.12.65 we had our bait at the Rupasingh beat taken. This beat goes up the Rupasing Nala 1,000 vertical feet and a scant 800 yards in length, but to get to our 'machan' without risking disturbing the tiger we do a detour involving a 3 hour march and a 1500 vertical feet climb. The beat produces no tiger, but as we move into position we hear a barking deer giving his alarm call far up the mountain towards the Baliagonda Pass and it is clear where the tiger is. On 27.12.65 we have a kill at our Kanskpoda beat, and again a weary tramp to our 'machan' and a perfectly conceived

and executed beat draws a blank. By now I agree that that tiger just does not lie up near his kill, a good 'Rehan' being involved notwithstanding. If he is to be brought to book classical tiger hunting technique just will not do.

On 30.12.65 I come to a decision. Incidentally, in the beats referred to above that big, old male tiger was in each case involved. If he will not lie up close to his kill, what is wrong with a long beat of some miles embracing where he is likely to have moved off? On these mountains classical 'stopping' technique is not important as one can tell to a yard a place over a pass he will naturally cross when disturbed or merely moving on his own.

On the flanks of 4,300 ft. high Purnadeo Mountain we have 2 beats, the one up the Rupasingh Nala and another one, a mile away up the Ranelay Nala near Rathong, called by us the Rathong beat. The 2 nalas meet near the Rathong Pass at about 3,500 ft. above sea level, some 1,500 ft. above the valley floor. Then the Rupasingh Nala climbs another 500 ft. to the Baliagonda Pass, on the way to the now deserted village of Baligonda, evacuated due to the havoc wrought by the man-eater. I decide on building a 'machan' at just below the Baliagonda Pass, cutting shooting and stopping lines there, and placing another bait out at the Rathong Pass. If we get a kill at either the Rupasingh, Rathong or this new beat, we shall beat up the Rupasingh and Ranelay (Rathong) Nalas, and when the beaters converge at the Rathong Pass the combined forces will beat up to the 'machan' at the Baliagonda Pass yet higher up. We shall 'stop' with flags and men on trees as 'stops' immediately on either side of the single 'machan' put up, but the rest of the beat (or rather 3 beats merged into 1) some $2\frac{1}{2}$ miles up the mountainside and up 2000 vertical feet will be 'unstopped'. We shall rely on a correct assessment of the tiger's line of retreat over the Baliagonda Pass and leave nearly all of the beat flanks 'unstopped'—we would need a 1,000 unobtainable men to fully 'stop' such a beat. Sanjlu, my shikari, is enthusiastic about the idea, and on 31.12.65 goes with his team of 24 men to make the necessary prior arrangements of erecting a 'machan' at the Baliagonda Pass, cutting shooting and 'stopping' lines, etc.

On 1.1.1966 we have a kill at the Nawasahi beat. A weary climb to the 'machan' on the ridge above, a climb of over 2 hours, which takes us just below the abandoned village of Maromar, another perfectly conceived and executed beat, and yet again no tiger in the beat. Again that old male tiger is involved. On 2.1.1966 we have a kill at Rupasingh

10.30 A.M. sees Ed, Alida, Christopher, Sanjlu, myself and 40 men for stops start on the weary climb to the Baliagonda Pass. Half way up 4 runners turn back to start on their arrival at the bottom of the hill the Rathong and the Rupasingh beats. We finish

our weary climb by 1.45 P.M., the 'stops' fan out and flags are laid. Far, far below at 2 P.M. we hear the crackers going off which herald the commencement of the twin beats. By 2.45 P.M. the beaters are within 400 yds. of us, and moving slowly, head down, out climbs *the tiger*, and exactly at the appointed place, 80 yds. from the 'machan' and ideal for the 'scope sight Alida is using' single shot through the brain from Alida's 328 Winchester Magnum fells him in his tracks. I insist on Ed and Christopher putting a bullet or two more each into him. We go up to him, and he is that big, old male tiger. He has a sore on his belly, which the local veterinarian the next day cannot quite explain. And he had two old wounds from muzzle loaders in him, one in the hip and the other in the ribs. One slug is recovered from the hip, which Ed keeps as a souvenir. It takes us 5 hours to get him down the mountain. He tapes 9 ft. 6 inches between pegs, 9 ft. 10 ins, over curves, and is in fine condition. I estimate his weight at 500 lbs.

I must now pay a tribute to the Sverdstens. I cannot imagine nicer and more sporting people to hunt with. When it became obvious that the tiger would not be caught in a normal beat, and as it was only already too obvious that sit-ups over kills would not pay, our chances did look dim indeed. Yet Ed and Alida never showed any trace of disappointment and after the hardest blank day were their usual cheerful and considerate selves. Ed is 63 years of age, and Alida nearly 60, yet these two got over those awful mountains with a zest and ability which would have shamed many a person a third of their age.

Ed and Alida have hunted by themselves and without guides the elk in the rugged mountains of their native Idaho. This by stalking. They naturally have more moods ability than many with a score of tigers to their credit. This couple were not only interested in bagging the tiger, but wanted to know all the details of the various beats worked out for hunt, and took the time and effort to walk over several of the beats. This did involve hard work as the beats, as already indicated, were mainly high up the mountains. In fact three-in-one beat which did have so successful an ending had as the germ of the idea a suggestion by Alida. The Rathong Pass was a key one, with four routes down from it to the valley floor below. Our beats having so far failed, and sitting up over kills likely to be useless, Alida suggested sitting up over live bait at the Rathong Pass. However, I felt even sitting up over live bait unlikely to succeed with this wily tiger, even assuming that one sat up night after night for a long enough a period to ensure the beast passing the area sooner or later. I felt instead we might put out an additional bait at the Rathong Pass, make the new beat above it, and then when a kill occurred at either the Rupasingh, Rathong or new beat, do a-three-beats-in-one effort which would make tiger hunting history if it succeeded. The results are now known.

If ever a hunter deserved his/her trophy, Alida did hers.

I should also like to pay a tribute to Sanjlu, my Santhal Shikari from Hazaribagh. The all important sitting of the single machan at the Baliagonda Pass was done by him alone, the men with him merely executing the work under his instruction. I did not go myself to the area. I merely told him to erect a machan at the most likely spot near the Baliagonda Pass, leaving the rest to his discretion. He chose the spot so that the tiger came out *exactly* where expected, this after a fantastic $2\frac{1}{2}$ mile virtually 'unstopped' beat up 2,000 vertical feet, and the final 'stopping' by flags and men near the single machan was quite unnecessary.

P.S. : We now find that the humerus of the left fore-leg had previously been broken just above the elbow joint and had later healed. This leg was slightly shorter than the right fore-leg. Beads and pieces from a woman's nose-ring have been recovered from the tiger's stomach. Just received a report that a woman was killed at Lottbro, 8 miles from Camp, on 1.1.1966.

Wild Life in Madras State

By

M.A. BADSHAH,

State Wildlife Officer, Madras

For the effective preservation and protection of the State's fauna and for developing and improving the existing Sanctuaries and forming new Sanctuaries a separate organisation styled as State Wildlife Organisation was formed on 1-7-1960, headed by the State Wildlife Officer. The State Wildlife Officer is incharge of all the Wildlife Sanctuaries in Madras State and also of other areas of wildlife interest outside the Reserved Forest.

I. Formation of New Sanctuaries:

(i) *Sanctuary for Tiger:*

As the population of tiger in Madras State was declining rapidly on account of ruthless shooting in the past, the status of tiger was raised to that of a Game animal thus affording it complete protection against shooting throughout the State. In August 1962, a Sanctuary for the Tiger which is the first of its kind in India was constituted at Mundanthorai in Tirunelveli District. The total area of the Sanctuary which comprises the whole of Papanasam and Singampatti Reserved Forests is about 200 sq. miles.

As a result of protection given to tiger, tigers are sighted more frequently now than before as reported by the members of the public residing in the area and the tourists.

With a view to prevent killing of tigers by follidol poisoning by the ryots residing in the vicinity of the Forests and the Sanctuaries, the Government of Madras have sanctioned a scheme for payment of compensation to the ryots whose cattle are killed by tigers subject to a maximum of Rs. 300/- per head of cattle. Compensation is being paid to the ryots as and when their cattle are killed by tigers.

(ii) *Point Calimere Wildlife Sanctuary:*

The Kodiakadu Forest in Tiruthuraipoondi taluk of Thanjavur district shelters incredible herds of Black buck and Spotted deer besides Wild pigs. This area has now been declared as Point Calimere Wildlife Sanctuary.

Point Calimere like Point Pelee in Canada attracts every year thousands of migratory water fowl from different parts of the world during winter. A heavy concentration of Flamingoes during winter is the chief attraction of this place. Twenty to thirty thousand flamingoes assemble in the great swamp here to feed on the juicy shrimps for which this Great swamp is noted. Next to the Great Rann of Kutch, this is the only place in India where flamingoes are seen in such large numbers. 112 migratory birds including a Rednecked Phalarope from the Arctic region were ringed at Point Calimere on November 12, 1962 by Dr. Salim Ali and the present author. One of the ringed birds was recovered on May 4, 1963 near Kupino in the Novisibirisk Region of U.S.S.R. about 4930 km (3,080 miles) from Point Calimere. This discovery was most exciting in as much as it proved that birds from Russia visit Madras State.

To protect and preserve the rare birds in the area, shooting of twenty-nine species of birds has been prohibited under the Wild Birds and Animals Protection Act, 1912 (Central Act VIII of 1912).

II. Waterfowl Refuges Outside the Reserved Forest:

Sixteen Waterfowl refuges (Wildlife Map enclosed) outside the Reserved Forest frequented by migratory and resident waterfowl in Thanjavur, South Arcot, North Arcot, Chingleput, Madurai, Ramanathapuram and Tirunelveli Districts have been constituted and protection afforded under the Wild Birds and Animals Protection Act of 1912.

The most spectacular of these waterfowl refuges is the breeding colony of painted storks at Munradaippu.

III. State Wildlife Board Emblem:

The State Wildlife Board at its VI Meeting held in 1961 decided that Black Buck should be adopted as the emblem of the State Wildlife Board, Madras.

IV. Selection of a State Bird:

The State Wildlife Board at its X Meeting held in 1966, resolved that the blue jay in flight will be adopted as the State Bird of Madras State.

V. Some Interesting Phenomena:

I recorded some interesting phenomena in the wildlife sanctuaries in Madras State.

Elephants and *gaur* (Indian Bison) are found grazing together. Gaur and elephants appear to be very good associates, for, the elephants help *gaur* in bringing down tall tender clumps of bamboos within the reach of *gaur*, which is greatly relished by them.

Similarly, monkeys in the Deer Park, Guindy, and common *langurs* in Mudumalai wildlife sanctuary were seen moving together. The monkeys climb the fruit-bearing trees and drop fruits for the deer assembled under the canopies.

No visitor to the Deer Park, Guindy, between February and April can miss the congregation of spotted deer under each tamarind tree, while the bonnet monkeys are on the top of trees dropping down half nibbled fruits to the deer herd below.

On 30-11-1962, I witnessed an interesting phenomenon in the forests along Moyar Road in Mudumalai wildlife sanctuary. Common langurs had climbed on the acacia trees and were found plucking and dropping the legumes to the parties of spotted deer eagerly awaiting under the canopies of trees.

Two visitors from the United States of America during their visit to the Mudumalai wildlife sanctuary with the wildlife staff witnessed an exciting drama of a python swallowing a spotted deer and they have recorded this incident in the Visitor's Book. A still more incredible incident occurred when a python was found swallowing a young *gaur* (bison) calf, when the mother of the calf was attacking the python to extricate its dear young one from its ever expanding jaws.

VI. General:

The Wildlife Sanctuaries in Madras State are attracting a large number of tourists and their number is increasing year after year.

A Forest Rest House has been constructed at Vedanthangal Water Birds Sanctuary to afford facilities to visitors visiting the Sanctuary. It was opened on 31-3-1967 by the Chief Conservator of Forests, Madras.

A telescope has been installed in the Observation Tower at Vedanthangal Birds Sanctuary.

Wild Life in Palamau

By

L.K. PANDEY

Unprecedented drought has flashed the name of Palamau in the head lines of different newspapers of the country and abroad. In forests, the ground became bare, trees and bushes leafless and the life giving water disappeared from most of the water-holes.

Before discussing the effect of drought on wild life populations and the efforts made to provide them with adequate protection and sufficient drinking water, it would be worth while to have a glimpse of the district, its situation, the climate and the forests. The district of Palamau forms the north western corner of the Chotanagpur Plateau, in the state of Bihar. It is situated between 23° 20' and 24° 39' north latitude and between 83° 22' and 85° east longitude. The name of the district is said to have been derived from the two words *Pala* and *mu* meaning a land of frost and deaths. It has a population of 12 lacs with a land area of 4,930 sq. miles. 45.5% of the district is covered with forests. The elevation ranges from 3,800 feet to 700 feet. The general drainage is from south east to north west towards the river Sone. The drainage is very rapid; principal rivers being Koel, Auranga, Amanat and Kanhar.

Most of the hill ranges are formed of gneiss of varying form. Many hills have defined ridges with sides falling away on both sides with steep gradients. Soil is generally a mixture of loam with pebbles. Pure *murrum* or a mixture of quartz pebbles with sandy loam soil is also common. All these have very little water holding capacity. The rivers and their tributaries are all rain-fed. Natural springs are few and are of little importance. These retain very little flow except in the southern corner of the district after the rains.

The average annual rainfall of the district is 52.55 inches (1,335 mm) most of which is received during July, August and September.

Winter months of December and January are cold and frost is common in deep valleys. The mean maximum and minimum January temperatures are 24.3° C and 8.8° C. while on individual days 0°C has also been recorded.

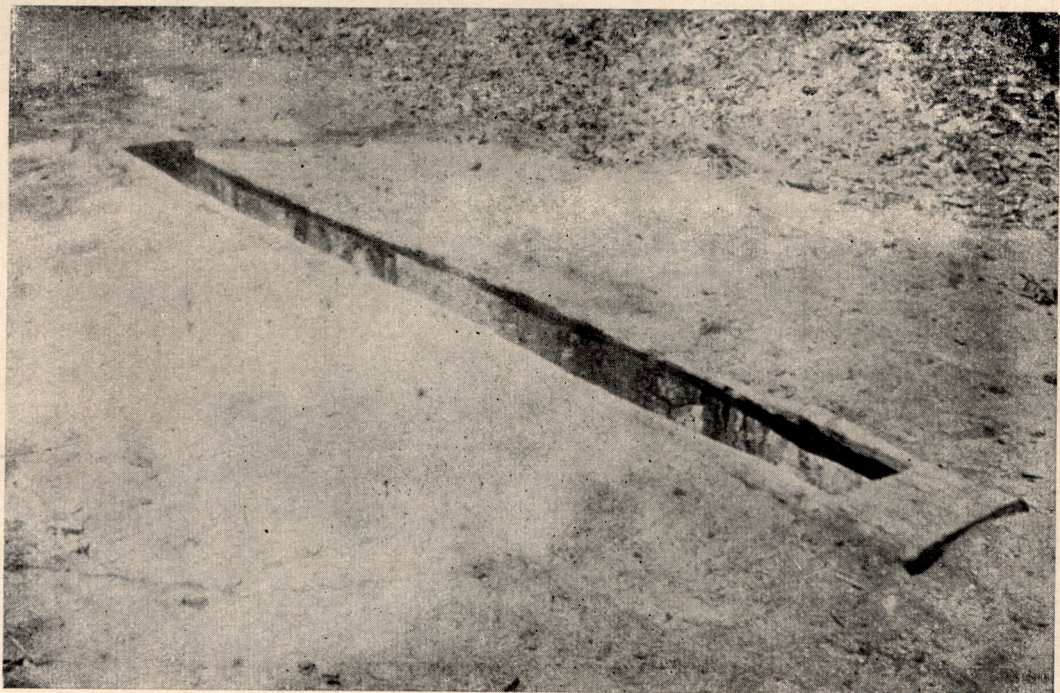
During summer, the period between mid-April to mid-June is most trying when severe hot winds blow and on many a day, the temperature touches 45°C.

The forest and its fauna

About 60% of the forest is dry deciduous, mixed-miscellaneous type with bamboo as understorey. Density of bamboo varies from place to place. Dry penninsular Sal with its associates is found in southern hills and valleys.



Bisons on a water hole.



Water trough made of hollowed tree trunk.
(For reference, see Page No. 46)

Fledgelings of the dusky horned owl.
Bubo Cormandus Cormandus
 (Anes: Strigidae)
 (For reference see Page No. 50)



Young of the Indian long-tailed
 tree mouse, *Vandeleuria*
O. oleracea (Bennet) (Rodentia
 Muridae)
 (For reference see Page No. 52)

The district has been famous for its rich wild life population. Varieties of animals, birds and reptiles are found, the important being the elephant, the tiger, the leopard, bear, wild dog, gaur or Indian bison, sambar, spotted deer, nilgai, four horned antelope, chinkara, the barking deer, mouse deer, wild boar among animals; the peacock, jungle fowl, black and grey partridge, quail among birds.

An area of 58 square miles was declared a wild life sanctuary and was given the name of Palamau National Park in 1959-60. Recently this has been extended to cover a total area of 96 square miles. The park comprises old reserved and protected forests. The newly formed protected forests which were taken over under Government management during 1947 form its fringes. Within the park, a number of reservoirs have been constructed to provide drinking water to wild life during the dry summer months. A number of natural springs have also been improved and maintained. In normal years these measures were sufficient to meet the water requirements of the wild life population within the park area. In the rest of the forest wild life found its own way in search of water to natural springs or small water holes where they used to become concentrated.

The general lie of the land and of hill-ranges as indicated above results in quick drainage of rain water. Most of the rivers and rivulets shrink to a thin flow after the rainy season and gradually disappear with the approach of summer. Rivers like Koel, Amanat, Kanhar hold some water at places in small pools where the bed is rocky.

Danger Signal

During 1965, the rainfall in the district was below normal with no winter rains. In 1966, with very little rain during the months of July, August and September it became quite clear that the coming months were going to be a most difficult period as regards water supply besides food and fodder. Against an annual average rainfall of 52.55" a rainfall of 9" to 20" was received upto the month of September in most parts of the district. This, too, was received in a few thunder showers during June and August with July remaining absolutely dry. The hot sun of July and October evaporated most of the moisture thus received and by end of October with the approach of winter, the future of several hundred thousand head of wildlife got locked up in gloom and despair.

The question of drinking water for 12 hundred thousand human beings and an equally large number of domestic cattle became the subject of discussion at various levels. Big drills and rigs were put into service. Large numbers of 'kacha' wells were dug. But the question of the supply of drinking water to wild life presented a different problem. The arrangements had to be made in forest areas, in far off corners, covering 45% of the land area of the district. The nalas had no sign of moisture by January 1967 except in Koel, Kanhar and Amanat which were fast drying up.

Facing the Drought

A quick assessment of the problem was made. There was no precedent to look to for guidance. To begin with things were not very clear except that all possible attempts were to be made and the situation was to be faced with all available resources. The methods employed were gradually developed from day-to-day experience.

The forests were first divided into acute scarcity areas, where urgent measures were to be started in January and February months. These were taken up immediately. There were other areas where scarcity of water would be felt a month later; in such areas steps could wait. A search was made for dried-up or drying natural springs. These were deepened and in most cases water reappeared.

In nala beds at suitable sites water galleries locally known as *chuas* were dug. These were located in such a manner that the animals did not have to traverse a distance more than 3-4 miles in search of water. These water galleries were 20' long, 10' wide and 5' deep with at least one of its sides sloping for easy approach by animals. The water galleries were kept regularly under watch and were cleared and deepened from time to time. It was found that beds of nalas with coarse sand and impervious rock underneath were the best spots where sufficient quantity of water was available within 5' to 8' of digging.

In areas, where such easy water was not available in sufficient quantity, temporary 'kucha' wells were dug. These were 15 to 25 feet deep, situated in depressions or in nala beds. At places blasting also had to be done in making such wells. By the side of the well, water troughs were placed. These were made of cement or hollowed-out tree-trunks. Drums cut into halves and joined at sides were also used for this purpose. These water troughs were fixed at the ground level so as to give it a natural appearance. As far as possible these water troughs were placed at such sites where in normal years natural water used to be available and used frequently by wildlife. The water troughs were regularly filled in the morning at 8 A.M. and in the evening by 5 P.M. after drawing water from the temporary wells.

In all about 200 water galleries were made and at about 25 places water troughs were distributed, in far corners of the forest of the district. In the National Park area there were about 45 such galleries and at 15 places water troughs were placed. Soon the water galleries became favourite spots for domestic cattle and it became necessary to make large size galleries in areas where the domestic cattle population was large. The large size water galleries were 200 feet long, 50 feet wide and 5 feet deep.

In the National Park area where the density of wild life population is higher, the quantity of water made available in water troughs and in natural springs was not sufficient to meet their requirements. A pick-up van fitted with a 500-gallon-water-tank was utilised to carry water every morning and evening to fill a number of water galleries. It was a sight to see animals, birds and reptiles making a beeline for these water galleries.

It was apprehended that with the concentration of Wild life near the water holes, poachers would also get active around these places. Issue of shooting permits was stopped everywhere in the district with effect from 15th March for all kinds of animals and birds.

The forest staff were given special instructions to keep constant watch over the water holes. In the National Park areas even the water holes outside the forest boundaries were kept under constant watch. Night patrolling was organised and at water holes where slightest indications of its use by poachers appeared, steps were taken to get hold of them. The forest staff were successful in catching such poachers redhanded in several cases. All these measures had a definite effect on the poachers' morale and it can be said with a certain degree of certainty that casualties at the hand of poachers during this period of distress have been far less than in normal years in the past.

Now that the days of distress are over and the monsoon has set in, in right earnest, it can be said with satisfaction that the efforts made to meet the scarcity conditions proved successful beyond expectation.

The total expenditure over this has been to the tune of Rs. 80,000/-.

A Suggested Technique to Determine Whether Pea Fowl Eat Jungle Fowl Eggs

By

R.K. BHATNAGAR & R.C. WALTNER

In a recent issue of the "Cheetal" (Vol. 10:1 pg. 12-13) the editors stated that population densities of jungle fowl (*Gallus murghi*) tend to decrease in areas where the pea fowl (*Pavo cristatus*) population is protected. The cause for this decrease was attributed to predation on the part of pea fowl upon the eggs of jungle fowl, however, direct evidence of this supposed predation is lacking. The editors requested help in determining methods by which pea fowl could be "caught in the act" of eating jungle fowl eggs.

We are of the opinion that pea fowl populations may adversely affect jungle fowl populations in a number of ways besides the possibility of eating eggs of jungle fowl. Two other possible negative interactions might be in competition for feeding grounds and nesting sites.

To determine whether jungle fowl eggs can be a part of pea fowl diet, some jungle fowl eggs should be offered to captive pea fowl. If the captive pea fowl eats jungle fowl eggs,

the method of eating the eggs should be carefully noted—does the pea fowl eat the entire egg or does it leave the shell? If the shell is left, its condition should be noted in order to look for similar shells in the field.

If captive pea fowl eat jungle fowl eggs, then the next step would be to select a natural habitat where both the pea fowl and jungle fowl abound (i.e., the Doon Siwaliks). The experimenter may proceed in two directions from here. He may select artificial jungle fowl nesting sites and place jungle fowl eggs throughout the study area and observe those sites for evidence of predation by pea fowl. As more difficult, yet more desirable, procedure would be for the experimenter to locate nests of wild jungle fowl in the study area and observe those nests for sign of predation by pea fowl. Because the experimenter cannot observe all nesting sites at the same time, care should be taken in order that pea fowl predation may be inferred by tracks in the nest area or by shells broken and discarded in a particular manner (previously determined by observation of captive pea fowl eating jungle fowl eggs).

Another technique which may be used to determine whether population densities of pea fowl affect population densities of jungle fowl would be to live-trap pea fowl. The trapped pea fowl would be released either into the study area or taken out of the study area. Assuming no more emmigration or immigration of the pea fowl population, the experimenter would watch for corresponding increases or decreases in jungle fowl populations and make appropriate inferences.

The experimental techniques described above would be best conducted by an ecologist rather than a biologist acquainted only with laboratory procedures.

Fledgelings of the Dusky Horned Owl, *Bubo* *Coromandus Coromandus* (Latham) (Aves : Strigidae)

By

H. KHAJURIA

Central Regional Station, Zoological Survey of India, Jabalpur (M.P.)

These fledglings (Plate 1) of the dusky horned owl were taken on 22nd April, 1967 from a hole in dried up tree locally known as 'Rasora' which had just been felled in the premises of a private house in Jabalpur City. The hole about 25 cm in diameter and $\frac{1}{2}$ mts long was located in a thick branch. An adult escaped from the hole but could be identified with

certainty. As the description of the fledgling of the form does not appear to be recorded the same is given below:—

General colour brown and blackish grey much lighter on the ventral side with white predominating on the throat, narrow area around the bill, anterior parts of the under surface of the wing and on the tarsus. Shafts marked with blackish bars of varying sizes and distinctiveness, much more defined on wings. Feathers finely and extensively vermiculated and mottled with brown and black, this pattern less defined on parts hidden from view. Tarsus covered with short white feathers. Iris light yellow and bill greenish white with black tip but the greenish on the bill changing to yellowish after a few months of preservation. The measurements (in mm.) are as follows:—

Tail —	Wing —	Tarsus—	Bill —	Weight
41,43,45	93,97,104	30,33,35	19,5,20,20	58,70,70

They were kept in captivity in a cage till 2-5-67 but the smallest had died on 29-4-67. In captivity they were fed on the vesperilionid bat (*Scotophilus heathi*), small lizards (*Calotes versicolor* and *Hemidactylus brooki*), the fish (*Heteropneustis fossilis*) and large moths but they appeared to relish lizards the most. If there was a fight to get at the prey, the lizards were swallowed whole, head first, by the stronger one. If it was larger, it was held firmly with claws and eaten by pulling out morsels with the bill. The food was always taken in darkness. Although water was provided in an earthen pot, they were not seen to drink but were frequently found sitting at the edge of the pot. Excretion was whitish. No regurgitation of pellets was observed.

They gave out a variety of sounds. If much disturbed, they would open the bill and shut it with a force producing a sound resembling 'jep'. Another sound produced under a similar situation was 'krun-krun' without opening the bill and appeared to be a threat. When fighting over food, they gave out shrieks like 'Kirrin-kirrin' particularly when two or more had got hold of the same prey and were pulling it in different directions. The smallest one was not seen to get a chance to feed in the presence of others and was always seen to utter 'chen-chen' possibly in hunger. If disturbed by others it would give out a sound resembling 'krin-krin'.

They were quite ferocious attempting to bite anything brought near them. They could open their eyes in bright light with difficulty and felt very comfortable in darkness.

I am thankful to Dr. B. Biswas and Mr. Humayun Abdulali for their suggestions.

The Young of the Indian Long-Tailed Tree Mouse, *Vandeleuria O. Oleracea* (Bennet) (Rodentia:Muridae)

By

H. KHAJURIA

Although the nominate race of the long-tailed tree mouse, a beautiful soft-furred arboreal species, appears to be quite common, its young as well as those of other races of the species do not appear to have been described. A young (O_+), measurements given below, was collected alive along with its mother (Plate 1) on 9th June, 1967 from a tree locally known as *Kanji* near a large water tank on the fringe of forest about 35 km. from Jabalpur. The nest lined by the green leaves of the tree was in cavity (*ca* $7.5 \times 10 \times 35$ cm) in the tree trunk about 113 cm. from the ground. Two other specimens, a young and an adult (?) escaped from the nest.

When kept along with its mother in a spacious wooden cage for about 24 hrs., the young was found to be much more active than the mother moving about with great agility and trying to escape. Although water was kept in an earthen pot in the cage, the animals were not seen to drink. The mother was observed suckling the young only once. They were so active even when tied with a string that all attempts to photograph them alive failed. They made several attempts to bite and would climb up very nimbly a thread tied to their feet. When kept in sunlight for a photograph, both the specimens died after struggling for sometime showing that they are quite sensitive to high temperature and sun.

The young has more or less the same coloration as the mother (dull reddish brown tinged with black on the back with white underparts) except that it is noticeably darker on the dorsal side and paler on the ventral parts. The ear and the foot are proportionately much longer than those of the adults as shown by the measurements given below.

	Head & body	Tail	Hind foot	Ear	Weight
Young O_+	49.5	82 (165.6)	15 (30.3)	12 (24.2)	5 Gms.
Adult O_+	75	120 (160)	16 (21.3)	14 (18.6)	15 Gms.

Measurements are in millimetres. The figures within brackets show the measurements as percentages of head and body length.

Zoo Management

By

BIREN GHOSE

Objects of zoological garden/park:

A zoological garden or park is invariably a collection of animals of various species from all the interesting corners of the world. It is intended for education, amusement, commercial purposes, research work and for the preservation and breeding of species which are on the verge of extinction. Its importance is vital. There are two types of zoological gardens or parks:—One is a commercial enterprise and the other organised for scientific study of animal life. A zoo run by a zoological society contributes to the scientific study of animal life.

What is a Zoo ?

In the words of Mr. William G. Conway, Director, New York Zoological Society, N.Y., U.S.A., "The Zoo" is a healing island of naturalness and reality in a megalopolitan sea of artificiality and unreality. An island that can give the people glimpses of beauty and mystery, and even unexpected familiarity".

Why should there be zoos ?

In these days of mechanisation, we want to escape the hum-drum surroundings and commune with Nature's beauty. We need the vitamins of wilderness to invigorate our weary minds and bodies.

Zoos can provide family entertainment like picnics, boating, swimming, fishing and also other recreational outlets. Even a miniature zoo can play an important role in the field of recreation.

A zoo can provide education, amusement, and scope for research work. It can fetch income such as gate fees, elephant-and horse-riding, toy railway, for children, boating, fishing, etc

A zoo can offer unique opportunities to us to enjoy the sight of wild animals of various countries which we may never visit.

Zoos can avort to a great extent further encroachment upon the declining stocks of wild beasts by breeding the endangered species. A zoo can be a centre for conservation of wild life.

Difference between a zoological garden and a zoological park:

In a zoological garden the display of exhibits is generally confined to cages and small enclosures while in a zoological park animals are exhibited in open air enclosures and in lakes,

etc. Also in such enclosures attempts are made as far as practicable to provide the captive animals with a natural surrounding akin to their natural habitats.

What is management ?

Management is a word which implies conduct, control, guidance, administration, arrangement and so forth. These words are the ideas and spirit of management. The man who bears the spirit and ideas of management in his character may be safely called a manager, i.e., management is materialised in him. Therefore if we gather and streamline our insight through the lens of his habits and behaviour, then the conducting capacity, arranging capacity and so on will be conspicuously noticeable in his character.

Different aspects of life:

Every living being has mainly three aspects of life—spiritual, psychological and physical. To nurture and influence the living being, a man is required to deal with the three aspects of its life practically, artistically and lovingly.

To deal with difficult problems and to face peculiar circumstances in a zoo, the officer should have experienced zoo operation, based on knowledge, constant vigilance and close intimacy with the behaviour of animals. Zoo management has already become a special subject and an independent science. To make it scientifically perfect, all developed countries are carrying on strenuous researches on this subject. Zoo management is a subject so vast and imperfect up till now that it is very difficult to produce and establish any hard and fast rules governing this subject. However, the approach should be scientific and the results obtained should be concrete.

I venture only to present in this paper some of my experiences in running a zoo.

To acquaint oneself with the scientific name of an animal is not so important and rewarding as to associate oneself with its behaviour, its abode, its ecology, its food habits, its peculiar characteristics, its other needs and its similarity with other animals, if any. The furred and feathered friends of a zoo like their human counterparts have strange quirks of character—there are individualists and eccentrics—the frivolous and the frigid, the timid and the terrorist.

Food for animals:

No one is perfect in the knowledge of the natural foods of all animals. The knowledge gained is still inadequate. We have to supplement their foodstuffs with vitamins, minerals and proteins. The animals should be provided with varieties of food so that they may not develop distaste for one type supplied regularly.

While food plays an important role in the life of all animals, one should also care for the physical as well as psychological needs of wild animals. This is very important. Only food

and housing would not suffice. Gregarious animals should be given companionship, burrowing animals—space to burrow, climbing animals—branches to climb up and down. For example—an orang-utan should be given a tree to keep up its habit of building nests in trees.

Various aspects of management:

Zoo operation is possible when the zoo officer deals with zoo affairs with his own knowledge aided by that of experts. He ought to be in touch with the experts of the zoological parks and gardens of the world. Thereby he can solve many problems. No man is perfect in the knowledge required for zoo management to solve all the difficult problems that he has often to face. Many degrees would not be of much use minus the experience. A naturalist may possibly do a world of good to minister comfort to the jailed animals and set matters right according to their natural wants. It should always be remembered that animals are divorced from their natural activities as a result of captivity. Accordingly, mixed plantations surrounding a lake in a zoological park or garden to attract migratory birds, jungle with various type of trees and plants should be made available to them as far as practicable. This would also change the outlook of the zoo. As we are happy at home so they are in jungles. A zoo officer has to deal with various subjects, viz., housing, feeding, pairing, purchase of animals, etc. He is also required to deal with very many delicate problems. In a zoo problems keep on coming one after the other. They never cease. Until every employee of the zoo inculcates the spirit of co-operation with the management of the zoo, it is well-nigh impossible to keep the show attractive and the face of the zoo smiling. The zoo should not necessarily be a 'One man show'. The scheme of the zoo may be from one expert. The implementation of the scheme is more difficult than the scheme itself. Hence it is the joint contribution and honest efforts of the entire zoo staff that can earn success.

Planning:

Planning, layout and construction of a zoological park or garden are of paramount importance. A costly or amateurish mistake will involve duplication of effort, expensive modification, heavy loss and dislocation of work. Therefore one should be well-conversant with the plans and programmes much ahead of their implementation. Mistakes—costly or otherwise may be avoided by discussion amongst planners, architects, and the zoo staff concerned with zoo welfare. The zoo architecture should be attractive.

The look of a zoo may be made charming only by beautiful landscaping.

Site selection:

A site with charming topography would be good. Big trees inside are welcome. Trees can be planted and horticultural work can be undertaken.

There should be a programme for future extension and hence ample space is essential.

Exchange of animals:

A zoo can flourish when there is a programme for exchange of animals with other zoological parks—at home and abroad. Hence the zoo officer should be well equipped with the knowledge of exchange and purchase of animals, cost involved in air shipment, by road and sea routes. The season has to be considered while transporting animals from a hot climate to a cold zone as sudden change of climate is very likely to bring about undesirable consequences—even death. It is, therefore, desirable that animals from a hot zone should be despatched to a cold zone only when it is summer in the cold zone. The transport of animals, birds and reptiles across thousands of miles of land and sea, proper nursing and feeding of them and protecting them from cold when taken from a tropical to a cold zone—all these factors need great care. Special boxes of different sizes according to the size and comfort of the animals have to be constructed, and carefully padded in case of birds, so that the captive animals may avoid injuries in their attempts to become free.

Overcrowding of animals should always be avoided for the following reasons:

(a) Chances of injury by fighting, (b) Chances of diseases spreading amongst all the specimens, (c) Chances of being cramped, (d) Difficulties entailed in cleaning the cages, etc.

Prior to shipment the animals have to be kept in captivity for a few days or weeks enabling them to be used to human beings and to the kind of food that can be provided to them while on journey which might differ in quality and taste from their natural diet. It is also essential that the animals should be in sound health and that no animals should be pregnant before shipment—inland or abroad.

Animals on arrival:

An animal or bird received on exchange or purchased locally or from outside should not be immediately displayed for exhibition. The same is to be kept under surveillance for at least a fortnight in quarantine. During this period the animal has to undergo a thorough medical check-up. He or she should be exhibited only if it is 'disease free'.

Causes of high casualty amongst newly captured animals:

Primarily the animals when caught become upset and become stressed in regard to diseases. Psychologically also they are affected and death may result. Captive animals are exposed to an unaccustomed environment, unfamiliar climate as well as unnatural foodstuffs. Secondly, they are prone to contract infections to which they acquired no immunity while in the wild state.

Watchward of a zoo:

In running a zoo the principle should be always 'Prevention is always better than cure'. This is not only applicable to the upkeep of animals but also that sometimes accidents can be avoided by foresight.

Animal's companion:

Animals need companionship as we need it. If they are devoid of companionship, they are very likely to develop 'Cage Boring' and may by and by run down, ultimately inviting diseases. Therefore attempts should be made always to exhibit animals in pairs or groups. In case an animal be the sole occupant of a cage, he is very likely to consider any intrusion with resentment. It has been observed that tiger, if not paired while quite young, would prefer a solitary existence. Lions, of course, differ in this respect. They are amicable in disposition towards one another and even they are known to accommodate species different from their own kind, setting examples of peaceful co-existence. The monkeys are gregarious animals and badly need the company of their own kind or of human beings. If a monkey is forced into a lonely life, he is very likely to die sooner. To bring up a Chimpanzee is difficult if it is kept without a companion. This intelligent animal feels a pang of separation even if temporarily separated from its caretaker. It so happened once in the Calcutta Zoological garden that the permanent caretaker of the chimpanzee 'Mohan' went on leave for a month or so. In his absence another caretaker was looking after 'Mohan'. The stamp of Mohan's face changed altogether a couple of days after the departure of the sole caretaker and was perfectly indicative of mental agony. He ate less, did not comb his hair, look through the mirror or prepare his morning tea as he used to do before. He rarely responded to our pet call 'Mohan'. 'Mohan' did not like this separation from the sole caretaker. Therefore the zoo officer should be aware of the ill-effects of sudden changes of caretakers and two caretakers should be in touch with such animals so that separation from one may not bring about any bad effect.

Social group:

Without forming even a social group the animals may breed. A sex pair of deer does not constitute a social group. Sex ratio within the group is an important factor. One stag for four hinds generally establish a social group. Social behaviour of animals may be absent if there be more males. Rather there may be fighting amongst stags. There may not be any rutting behaviour during breeding season.

Occupational therapy:

The monotonous existence of zoo animals can be ameliorated:

Otter:—A rubber beach ball in a pool of water to play with.

Hippo:—A big piece of floating wood—ovalshaped. *Cubs*:—Wooden balls. *Polar bear*: A log in their pool. *Elephant*:—Branches of trees or planks. *Macaw*:—Oval shaped small stones.

—To be Continued in Next Issue

Special Report: The Wild Life Organisation in Dehra Dun Region

By

R.S. BHADAURIA

Wild Life Warden, Dehra Dun

The Wild Life Organisation in U.P. came into being in September, 1956, as a separate Organisation, within the Forest Department, to implement preservation and development of Wild Life which was diminishing alarmingly. This step was one of the first of its kind in the country because till then the game preservation laws were being enforced by the territorial Forest staff. Being pre-occupied in the important forestry activities they could pay little attention to the fauna.

The creation of this separate Organisation to look after and protect Wild animals from wanton destruction has paid dividends. Wild Life in U.P. is thriving despite shooting by legitimate 'shikaris'. It was under this scheme that the Dehra Dun Region was created, one of the seven wild life regions of U.P. It comprises East and West Dehra Dun divisions, Siwalik Division (formerly Saharanpur Forest Division) and a part of Tons Forest Division, called Govind Pashu Vihar. The total forest area under this region is 1066.047 sq. miles.

A Wild Life Warden of the rank of an Assistant Conservator of Forests, is in charge of the region, assisted by 5 Assistant Wild Life Wardens (Deputy Rangers) and 22 armed Wild Life Guards posted at suitable places in the forest. The Wild Life Warden has been provided with a jeep and an escort of armed police, consisting of one Head Constable and three Constables. The vehicle and the armed escort make it possible for the Wild Life Warden to carry out raids and to apprehend poachers, who sometimes open fire. Assistant Wild Life Wardens have been provided with motor cycles and Wild Life Guards with cycles in order to patrol their jurisdictions. All Wild Life Guards are armed with either 12 bore D.B.B.L. guns or 410 musket guns.

The main task of the Organisation is to protect Wild animals from illicit shooting. Besides this the Organisation has been helping, and affording necessary facilities to visitors, to the sanctuaries. The protection aspect assumed greater importance and had to be given preference over other fields of activity, because of the indiscriminate killing of wild animals and birds by people from all walks of life.

The measures adopted to check poaching were preventive and deterrent. The preventive measures include day and night patrolling by Wild Life Wardens and their staffs in several groups going to undisclosed areas at odd times. By doing this we sometimes come

across wandering poachers. Such undisclosed movements keep the poachers from entering the forest for fear of being caught. It is not that we always move about unplanned. Often planned raids are carried out to catch poachers, when useful information is received. For this we have to maintain an effective intelligence system by creating local informers at various places. The informers are rewarded when their information proves true.

The major part of the objective of checking poaching is achieved by means of preventive measures, described above, in which every attempt is made to keep the poachers away from the forest. But it is not uncommon to catch a poacher in the very act or possession of the bag or a few days later. In such cases the deterrent measures are the only effective means. These induce heavy monetary penalties, confiscation of arms, suspension of arms licences and, if necessary, prosecution in a court of law to inflict heavier punishment like imprisonment. All these measures are to deter the poacher from indulging again in such unlawful acts. The following Table gives an account of poaching cases (including illicit fishing) caught, and compensation realised during the last three years in this region:—

Year	No. of cases caught	No. of offenders involved	Compensation realised Rs.
1965-66	47	76	5436/-
1966-67	58	122	4913/-
1967-68	96	169	8607/-

The above Table gives the misleading conclusion that poaching is increasing. Quite the contrary infact, the increase in the number of cases caught is because of more intensive work done by the staff, their acquired experience in rounding up tricky poachers and bringing even petty cases to the book to ensures that Wild Life Preservation laws are respected in the real sense. Particularly during 1967-68, the biggest-ever offensive was launched against poachers, which resulted in the highest record of offenders caught and compensation realised in this region ever since its creation. However most of the poachers were caught before they could shoot something.

It has been a very sad experience that even some permit holders did not respect game laws and indulged in poaching. During 1967-68 nine such permit holders were caught and punished suitably. It is not desirable to give here a list of poachers caught and penalised, but it includes high ranking military officers, civil officers, businessmen, farmers from the villages and even labourers, who generally indulge in illicit fishing.

Poaching by means of vehicles, by the so called 'big poachers', is comparatively much less than that done by villagers on foot, as illustrated below. It is also easier to detect vehicular poaching than the other type.

Year	No. of vehicular poaching cases	No. of non-vehicular poaching cases	Total
1965-66	6	41	47
1966-67	8	50	58
1967-68	22	74	98

As shown above, the village poachers, creeping into the forest stealthily, at remote points, are still our major concern. In Dehra Dun region the Gurkha population of the villages, fringing the forest and nomadic shikaris of Jaunsar-Babar, who come in big parties consisting of 30 to 40 armed persons, have been taking a heavy toll of animal life in the past. I, therefore, paid special attention to rounding up such poachers. In the year beginning from April 1967, to March 1968, 38 Gurkha poachers were caught in the Doon and punished suitably. Five cases are being tried in a court of law and steps being taken to get their arms licences cancelled.

The poachers coming from Jaunsar-Babar were never rounded up before, probably because of their strength and the strategy they observe while poaching. They come at night, on foot in big parties, with 2-3 day's ration on their heads and enter the forest, at places which can be reached only on foot. They go into the interior of the Siwalik gorges where they kill and hide animals. The most intricate problem to deal with such poachers was to get timely information of their entry into the forest and their later whereabouts. Therefore informers were created in the villages by offering them rewards.

One such information was received on 20-5-67, that a party of Jaunsari poachers was poaching in the interior of Timli range. Immediately I rushed to Timli with my police guard and there I found Assistant Wild Life Warden, West Dehra Dun, with all his 5 Wild Life Guards waiting for my arrival. Thus our party became a dozen strong with every body armed. Surrounding the party in the forest and facing them, when they keep their arms loaded was risky, because they do not hesitate in retaliating and also they would have strayed into the forest. Therefore it was decided that the party should be apprehended on their return from the forest, when they normally keep their arms folded and concealed inside 'potlis'. To ensure that the party left the forest the same night, we raced our vehicles inside

the forest, creating noise, to give them the impression that the forest staff was searching them. This trick worked and the party really started moving down to leave the forest at night. By evening the informer could tell us the route, which the party was likely to follow. We, therefore, sat near that route, hiding ourselves behind bushes and spurs, to trap them when they emerged barehanded. At about 11 P.M., to our surprise, 30-35 persons were seen, lining the anticipated route, with 'potlis' on their head. Our plan was to trap at least some of them by surprise, as they approached us, by firing some shots in the air. As they came near, our head constable shouted at them to 'stop' but before we could get near them, some of them fired either at us or in the air, and started running away. We naturally took cover and started firing in the air at the same time shouting at them to stop. They ran pell-mell and strayed into the fields after throwing their 'potlis' from their heads. We collected these in the morning. We then rushed to the Yamuna bridge, expecting them to cross the river at Kalsi. They never reached this, and crossed the river somewhere else. The shikaris. Probably got suspicious of our moves from the very beginning, and this is why they brought loaded guns with them while going back from the forest. Normally they hide their weapons, inside 'potlis' because most of the weapons are unlicensed.

Although we could not catch any one from the above party of poachers, yet it created a stir among the Jaunsari poachers and after this incident, no other party, from Jaunsar-Bawar ever visited the forest again. Before this incident, these Jaunsari poachers were never chased and troubled like this. We are, since then constantly, on the look out for such parties in the area, which was their favourite hunting ground, but probably that incident had its desired effect.

Another source of trouble—the Paonta area of Sirmur District, H.P.—from where such parties used to enter the forests in Timli range was recently detected, when, on 31-3-68 after a hot chase we succeeded in apprehending one such party of 3 poachers accompanied by some beaters from Himachal Pradesh. The offenders had to pay Rs. 2700/- as compensation. The effect of this heavy penalty would be carefully watched by us.

In order to educate the public to develop love for Wild animals, we organise meetings in the villages, and explain the importance and sanctity of Wild Life. During the years 1966-67 and 1967-68 respectively 51 and 45 meetings were held in the villages, bordering the forests. The effect is favourable and more and more people are changing their attitude towards wild animals.

Public co-operation to stop poaching and to apprehend offenders is very essential and every attempt is made to seek their help and associate them with this movement. I have found during the course of enquiries made in poaching cases that in the very neighbourhood of poachers there are always some conscientious men who are opposed to the indiscriminate

killing of wild animals. So help from such persons has been forthcoming in their individual capacity, but now we are trying to form in the villiges 'anti poaching committees' consisting of such helpful persons who would collectively lend their valuable support to us by being our on-the-spot custodians. This venture, if it succeeds, would go a long way to help curb the activities of poachers.

In Dehra Dun forests the animal population touched the lowest ebb near about the period 1956-58. Now because of the continuous and relentless efforts made by the organisation over the years, and by enforcing periodic closures over affected areas, it has been possible to turn the tide in the right direction and the animal population is now increasing.

On the 'research' front the organisation is still ill-equipped with necessary technical know-how and resources to carry out animal population and ecological surveys scientifically. But still a chital census was once done in 1962 by the drive and count method with the assistance of the Zoological Survey of India in the erstwhile Dehra Dun Forest Division. Recently we carried out an elephant census by localising herds and then counting them. This operation was conducted on 3 successive dates, i.e. April 15, 1967, May 30, 1967 and June 15, 1967 and in this region the number of elephants counted, came to 35, 77 and 48 respectively. Despite the crude method of counting the wide variation in number is mainly due to the fact that elephant herds keep on crossing the Ganges to Lansdowne Division. Let us hope that the organisation will improve in techniques of wild life study, research and management.

We are fortunate its having the unstinted co-operation of CHEETAL and the Wild Life Preservation Society of India in this regard.

Tiger Tracks

By

DR. R.N. MISRA

Imagine yourself in a 'Jungle' camp on a brilliant early-spring morning in the glorious countryside where the foot-hills of the Himalaya leap out of the plains without warning; where fragrant forests of gigantic trees, creepers, bushes and grass harbour wondrous wild life, where sambhar swarm in their natural habitat; where a little before sunset, the tiger his fur shining like burnished gold in the glow of the setting sun, starts patrolling the nullah beds, fire lines, forest paths, jungle roads and the feeding grounds of deer in search of prey.

The expert 'shikari' with experience of having worked with Jim Corbett and F. W. Champion, reported a 'kill' and the presence of four tigers in the beat. I had been delayed

at another 'kill' a few miles away and had my doubts on hearing the 'shikari'. The perfectly organised beat and good luck produced two tigers in the beat. There was no trace of the other two. At the evening campfire we discussed tiger tracks.

There has been large scale destruction of tigers in India and a bag of nearly two thousand tigers by the late Maharaja of Surguja is an indicator. The destruction continues unabated, not so much for sport that shooting tigers undoubtedly is, but to promote tourism, earn profits and precious foreign exchange. The trigger-happy sportsmen have studied tigers only over the sights of a rifle. The tribals and villagers who have studied tigers, never had the chance to write. There are scores of interesting books on tiger shooting but few authors have written about the manner in which a tiger walks and the tracks he leaves. Jim Corbett, A.N.W. Powell, Sher Jung and Champion, a pioneer among wild life photographers in India have written about tiger tracks in their books. Even George Schaller in his book 'The Deer and the Tiger' does not pay much attention to tiger tracks.

The tribals of the forests south of the Kaimur Range in Uttar Pradesh can judge the approximate length of a tiger with a blade of grass and the width of their fingers. Corbett claimed to estimate the size of a tiger within an inch or two by the size and the depth of pug-marks. His conclusions could at best be approximations.

Some tigers have a thick set and heavy body with a short tail while others have a longer tail. The mood of the tiger at the moment, the nature and the moisture content of the ground surface could easily upset correct calculations. Even the pug-mark of a tiger cub is far larger relatively. The marks left by the fore feet are larger than the marks left by the hind feet. The pug-marks of a tigress are a bit oval when compared with the rounder imprints of a tiger. It is sometimes difficult to distinguish between the two and Champion's photographs indicate that a confusion is possible. Large panthers of the 'terai' leave pug-marks easily confused with those of a small tiger.

Champion claims that each tiger can be distinguished by his special pug. This is open to doubt and unless a few same sized pug-marks are photographed and seen the result is likely to be a confusion. Distinguishing individual tigers by pug-marks is possible in case of a deformity or an extraordinary size which no other tiger in the area has. Champion's conclusions are based on a study of few known tigers of particular localities where they did not have to go far in search of food, water and shelter and the territories were well marked.

Having seen the tracks of a few hundred tigers in different parts of India, of cubs and tigresses, of game killers and cattle-lifters and occasional man eaters during my 'shikar' excursions in the last forty years I believe that when a full grown tiger walks relaxed and on even ground, stream beds and forest roads, he makes a double track, his hind feet falling a few inches in front of the fore feet. A young tiger under the same circumstances, makes a single

track, the hind feet falling exactly in the pug-marks of the fore feet. The tiger which left a single track for miles, photographed by Champion must have been a young tiger and not an old one.

The theory that a tiger places his hind feet in the places found by fore feet deliberately to avoid noise is apparently false because it is the experience of all sportsmen who have sat over tiger kills in forest areas that a tiger can come and disappear without making the slightest noise, almost like a phantom, over areas thickly carpeted with dry leaves. The only noise may be the cracking of a dry twig hidden under the dry leaves when a tiger places his foot by chance on it.

Even a fully grown tiger can leave a single or a double track depending on the ground over which he is walking, or when taking a turn or launching an attack. Tracks show only the impress of the toes and the pad behind them because a tiger walks on his toes. The spoor shows only four toes on the fore foot though he has five; the fifth one being set high up the foot, thus leaving no mark on the ground. The hind foot has four toes. The sharp claws of a tiger remain sheathed and leave no mark on the ground and come into play to hold the prey and to tear flesh. Tigers sharpen and clean their claws on thick branches and trunks of trees with soft barks. I have seen a tiger swinging from a branch growing parallel to the ground over a narrow water course in his efforts at sharpening and cleaning his claws. If one is on the look out for tiger tracks, the ground as well as suitable trees are to be scrutinised, for deep scratches on the bark.

One who walks on forest roads used by tigers on their nightly prowl often finds the grass and the ground on the forest side of the road scratched lengthwise and parallel to the road, the scrapes being nearly two feet long and six to twelve inches wide. One may find faeces deposited on the scrapes. Often the faeces are covered by dust and grass scratched. Tigers use their hind feet, often one foot to scrape the ground. If the tiger has had a heavy feed in the locality the quantity of faeces deposited is large. A tiger may travel many miles without scraping the ground. A number of conclusions may be drawn on examining the faeces and scrapes and the easiest one is to know the direction in which the tiger is travelling.

Tigers appear to glide rather than walk and the glide is attributed to the fact that both legs of a tiger on each side of the body advance simultaneously and he moves like a 'pacer'. Artists often commit a blunder in drawing tigers and showing the feet diametrically opposite, touching the ground simultaneously.

Big game shooting is being replaced gradually by wild life photography which is being supplemented with ecological study of animals. Tiger tracks are worth a detailed study and wild life students should follow in the foot steps of George Schaller for recreation and for expanding our knowledge of wild life.

प्रकृति का रहस्य

प्रकृति किस तरह अपने जीव-जन्तुओं की रक्षा करती है इसे जानकर आश्चर्य होता है और इसका अनुभव तभी हो सकता है जब जंगलों में घूमा जाए और जंगली जीवों को स्वाभाविक रूप से देखा जाय। यों तो हर जाति के पशु-पक्षियों का रंग-रूप, आकार-प्रकार गंध आदि अपने जाति-भेद के अनुसार अलग-अलग होते हैं, परन्तु प्रकृति उन्हें भी समय-समय पर उनकी रक्षा के लिए बदल दिया करती है। इसका अनुभव मुझे तब हुआ जब मैंने जंगलों में रहकर इस उद्देश्य से इनका अध्ययन किया।

पहले जंगलों में रहने वाले उन छोटे-छोटे जन्तुओं को ही देखिए जो हजारों दुश्मनों से बराबर घिरे रहते हैं, जैसे तीतर, बटेर, मुर्गियाँ, खरगोश इत्यादि। इनके दुश्मन साँप, गोह, गीदड़, लोमड़ी, कुत्ते, नेवला, बाज आदि बहुत हैं। कुछ निरीह और कमजोर जन्तु ऐसे हैं जो रात्रि में भी जमीन ही पर रहते हैं तथा इनके अण्डे और बच्चे भी जमीन ही पर रहकर पलते-बढ़ते हैं। तीतर, बटेर, मोर, मुर्गियाँ वगैरह बहुत से ऐसे पक्षी हैं जो पेड़ों पर अपना घोंसला नहीं बनाते। इन पक्षियों की मादाएँ जमीन पर ही खुरचकर अण्डे देती हैं तथा उन पर बैठती हैं। उन अण्डों से बच्चे जब निकलते हैं तब तीन-चार महीने तक वे उड़ने लायक भी नहीं हो पाते। परन्तु इनकी संख्या में कमी नहीं दिखलाई पड़ती जबकि सभी दुश्मन इनके आस-पास ही घूमा करते हैं। इनकी संख्या में तभी कमी दिखलाई पड़ती है जब वे बन्दूकधारी शिकारियों से रौंदे जाते हैं। कुत्ते, गीदड़, नेवले इत्यादि शिकारी जानवर जिनकी घ्राण-शक्ति बहुत ही तेज होती है और जो हमेशा जंगलों में ही रहते हैं, उन अण्डों तथा निरीह बच्चों को अधिकतर नहीं पकड़ पाते। इसका मुख्य कारण यही है कि प्रकृति ठीक मौके पर उन्हें बचाती है। ऋतुकाल के समय जन्तुओं के रंग-रूप में परिवर्तन प्रकृति तो करती ही है लेकिन इनका अधिक उपकार इनकी गंध को बदल कर करती है जिससे तेज से तेज नाक वाले शिकारी जानवर भी इनका पता नहीं पाते हैं। इसकी सत्यता नीचे के उदाहरण से पुष्ट होती है।

जंगलों में घूमते-फिरते हमने कई बार देखा है कि शिकार में प्रशिक्षित कुत्ता, जो हमारे साथ-साथ शिकार में घूमता था और जिससे कोई तीतर या मुर्गी नहीं छूट पाती थी, वह भी पगडण्डी के पास में अण्डों पर बैठी हुई मुर्गियों का पता नहीं पा सका जबकि हमने उन्हें देख लिया। हमने यह भी देखा कि तीतर या मुर्गियाँ और दिनों में आदमी या कुत्ते को देखते ही घबरा कर उड़ जाती हैं, लेकिन वे अपने अण्डों पर चुपचाप बैठी ही रह गयीं। इससे पता चलता है कि जिस गंध से कुत्ता परिचित था वह उस समय उन पक्षियों में नहीं थी। दूसरे मौके पर एक बार मैं शाम को घास से भरे हुए एक गड्ढे के पास से गुजरा तो उसमें से कई चाहे (Jack Snipe) उड़े। उनमें से एक दुर्भाग्यवश पेड़ की डाल से टकरा कर वहीं पर गिर गया। जुलाई का महीना था और इस महीने में स्नाइप न तो मैंने कभी पहले देखा था और न देखने की उम्मीद करता था। मेरा एक नौकर उस घिरे हुए स्नाइप को उठाकर मेरे पास ले आया। मुझे घोर आश्चर्य हुआ कि इस वेमौसम में स्नाइप यहाँ रह कैसे गया। उसकी शक्ल तथा रंग बदला हुआ था। अचानक देखने पर वह गुहियल मैना जैसा लगता था और उसमें से गंध ठीक मछली की जैसी आ रही थी। उसे मैं अपने बगले पर

ले आया और पास में लगे धान के पौधों के बीच छिपा दिया। इसके बाद अपने प्रशिक्षित शिकारी कुत्ते को उसे ले आने के लिए छोड़ दिया। इधर-उधर घूमते हुए कुत्ता उसके पास से गुजरा परन्तु उसे उठाकर नहीं लाया। यद्यपि शिकार के अन्य दिनों में कोई स्नाइप का इस तरह छूट जाना बिलकुल असम्भव था। कुत्ते से उस स्नाइप के इस तरह छूट जाने का कारण था उसके रंग और गंध में परिवर्तन।

इस तरह गंध परिवर्तन जंगली चौपायों में भी हमने पाया है। विशेषकर ऋतुकाल में बाघिन की गंध स्पष्ट रूप से बदली हुई पायी जाती है और जंगल के जिस रास्ते से गुजरती है अनुभव होने पर साफ पता चलता है। यों तो बाघों में हमेशा कुछ हल्की गंध रहती है परन्तु ऋतुकाल में बाघिन की गंध बहुत तेज तथा बदबूदार होती है और प्रकृति ने शायद इसीलिए ऐसा किया है कि हवा के जरिए दूर-दूर तक बाघिन की गंध नर-बाघों तक पहुंच जाय और जंगलों में घूमने वाले जानवर तथा मनुष्य भी सावधान हो जायें। चूंकि ऐसे मौके पर ये जानवर बड़े भयानक हो जाते हैं।

जिस तरह जंगली पशु-पक्षियों में गंध होती है और मनुष्यों में भी गंध होती है। साधारण मनुष्य भले ही इसे नहीं समझ पायें हवा के जरिए मनुष्य की गंध भी दूर-दूर तक पहुंच जाती है और जंगली जानवरों को सचेत कर देती है। खासकर सामर, बारह सिंघा, मारखोर, आइवेक्स इत्यादि पहाड़ी जानवर मनुष्य की गंध को जल्द अनुभव कर लेते हैं। कश्मीर की पहाड़ियों में हवा का जान बिन रखे हुए कोई शिकारी इन जंगली जानवरों के शिकार में सफल नहीं हो सकता। हमने कई बार पीछा करते हुए देखा है कि इन पहाड़ों पर अचानक हवा बदल जाने से ये जानवर तुरन्त ताड़ गए हैं और वे भाग निकले हैं। इस तरह प्रकृति इन जानवरों की रक्षा बड़ी दक्षता से करती है।

एक दिन की बात है कि हमें सिंध की वैली में एक नाले का पता लगा और हमारे खोजी शिकारियों ने बताया कि उसमें एक बहुत अच्छे सिंगों वाला बारहसिंघा देखा गया है। उन लोगों ने यह भी कहा कि कंगन डाक बंगले से उसका पीछा नहीं किया जा सकता, क्योंकि उस नाले के दहाने पर पौ फटते पहुंच जाना चाहिए। उन लोगों ने उस दहाने से दो माइल की दूरी पर रात में ठहरने की सलाह दी। मैं भी एक अच्छा बारहसिंघा मारने के लिए बहुत उत्सुक था और उन दिनों दस मील तक चलना-फिरना मेरे लिए कोई कठिन काम नहीं था। मैं भी सहमत हो गया। रात का खाना टिफिन बासकेट में लेकर उन लोगों के साथ चल दिया। सूर्य छिपने के पहले मैं वहाँ पहुंच गया और गुजरों की छोड़ी हुई भोपड़ियों को साफ-सुथरा करके डेरा डाल दिया। जमीन पर बिछावन लगा दिया गया और चार बजे भोर में जाग जाने के लिए घड़ी में एलार्म ठीक करके मैं सवेरे ही सो गया। सुबह ठीक समय पर उठा और खड़ स्टीक के सहारे उस दहाने पर पहुंचने के पहुंचने के लिए चढ़ना शुरू किया। साथ में दो खोजी शिकारी तथा एक कुली राइफल के साथ चल रहा था। कुछ कठिनाइयों के बाद ठीक समय पर अपने निश्चित स्थान पर हम पहुंच गए। भोर का समय बड़ा ही सुहावना था। जब कुछ दिखलाई पड़ने लगा तो मैंने काँलगेट का पाउडर निकाल कर हवा का अन्दाजा लगाया। भोर में अधिकतर नीचे से ऊपर की ओर हवा बहती है। यही कारण था कि हम लोगों को उतना सवेरे गिरते-पड़ते ऊपर उस दहाने पर पहुंच जाना था। शिकारियों ने दूरबीन से नालों में देखना शुरू किया। थोड़ी

ही देर बाद बगल के दूसरे नाले में वह जानवर ऊपर चढ़ता हुआ दिखलाई पड़ा। हम लोग बहुत सावधानी से उस नाले पर पहुंच गये और अपना स्थान ले लिया। रायफल भरकर तैयार कर ली। बड़ी उत्सुकता से उस जानवर को अपनी रेंज में आने की प्रतीक्षा करने लगा। वह जानवर जब करीब ३०० गज के फासले पर आया तो एक मिनट के लिए रुका और उसमें कुछ चंचलता के चिह्न दिखलाई पड़े। इसके पूर्व वह बड़े इतमिनान से निःसंकोच हमारी ओर बढ़ा आ रहा था। किन्तु अब वह भयभीत और आशंकित दिखलाई पड़ रहा था। यकायक वह बोला और चौकड़ी भरता हुआ दृष्टि से ओझल हो गया। जब मैंने कालगेट का पाउडर उड़ाया तो देखा कि हवा हमारे विपरीत थी। इस तरह उस दिन की मेहनत बेकार चली गई। लेकिन हम हिम्मत हारने वाले नहीं थे। तीन दिनों तक पीछा करने के बाद वह बारहसिंघा हमारे हाथ आया। पहाड़ी जानवरों के शिकार में गंध का प्रमुख स्थान है।

Book Reviews

THE DEER AND THE TIGER--A Study of Wildlife in India. By George B. Schaller, 1967 (University of Chicago Press, Chicago and London), 370 pp., 30 pls., 17 figs., 58 tables, price 72 S. net.

The last few years have been very auspicious for Indian wildlife. There have been a number of important publications both of general and specialized nature on the subject. Dr. Schaller's book can easily be considered the best under any of the two categories. The author spent about twenty months in India studying wildlife in various parts of the country but his main study area, where he spent about fourteen months, was Kanha National Park (Madhya Pradesh). The enormous amount of data incorporated in this remarkable book was, thus, collected in a rather brief period. He was well prepared for this work because he had already considerable experience in the study of wild animals, particularly in Africa where he did admirable work on the mountain Gorilla. I came into personal contact with him for a few days at Kanha and was greatly impressed by his interest in wild animals, many of which he knew individually. They, in turn, appeared to recognize in him a true friend.

The book is divided into three parts. The first part contains an introduction, an account of study locations, methods of investigation and general ecological conditions in different parts of India, particularly in Kanha National Park. Part II has six chapters. Each of the first five deals with one of the principal species of hoofed mammals studied, i.e., the chital, the swamp deer, the sambar, the black buck and the gaur. The sixth chapter deals with ecological and behavioral comparisons of the above species. Part III, containing three chapters, gives an account of predators, particularly the tiger, and discusses the effect of predation on the prey in Kanha Park. A detailed account of descriptive features, geographical and ecological

distribution, population dynamics, general and social behaviour, food habits is given under each of the above species. The book is well illustrated. A detailed list of references discussed in the text, and an index, is provided.

Besides a large amount of new data and revision of the previous information on the subject, some more important features of the work are modern population studies, data on food habits, parasites and diseases and detailed and accurate field notes. A characteristic feature is the individual recognition of wild animals without marking, showing the exceptional power of observation of the author. To wildlife conservationists in India, the book provides a valuable basis for future work. The author has tried to show which species in Kanha Park is increasing, decreasing or stationary and why. For example, in the case of the swamp deer, the author unaccountably calls it barasingha, he has shown that addition to its population is lagging far behind the loss being suffered by it through poaching, predation and disease and the species is likely to disappear from the park in the near future. Although a sufficient number of females become pregnant, very few young reach the yearling stage. It has been suggested that the population may be suffering from brucellosis or some similar disease which causes abortion. The Central Indian race of the swamp deer appears to be rare and its extermination in Kanha Park would indeed be a tragedy.

In the case of the blackbuck, another species which has suffered a drastic decrease in its population in the park, the author points out that rate of increase in population is normal and loss due to predation and disease is low. The abnormal decrease in population is, therefore, apparently due to poaching. An important new finding is that there is no overcrowding of wildlife in the park and the present population can easily be increased considerably, particularly if cattle are withdrawn. Some of the species (the wild dog, the sloth bear and the python) which were considered to be common in the park appear to be rare on the basis of this study.

Individual recognition of large numbers of wild animals without marking, so conspicuous in the work, is worth emulating and would solve several wildlife problems. However, an ordinary observer will find it generally very difficult to practice it or at least to convince others that he is right. The author has tried to solve several difficult problems through this method. On p. 24, it is stated that Kanha became famous for hunting only after 1879. However, it appears that the place was recognized as good hunting ground since time immemorial. The meadow in the centre of the park is called Shrivant and the place, the edge of Shrivant tank, where King Dashratha (father of Lord Rama) killed holy Shrivana at night, mistaking him to be a deer, is still worshipped occasionally. A brief discussion of the fauna of the park other than the species studied, would have made the study more complete. Several species, e.g., free living insects, must also be influencing the lives of mammals in the area. It is not

clear why the author has not used the metric system in measurements and preferred to use Indian names for some of the species and English names for the others. The title of the book does not appear to convey the much more valuable and technical nature of the contents. The above are a few minor points casually noted for consideration of the author during future revisions of the book, which is bound to be in heavy demand as the best work on the subject so far.

The data has been collected by the author at considerable personal risk. While moving about on foot alone, he has several times met tigers only a few metres away and on one occasion only about one metre away. On some occasions, he has even been chased by tigers. Some of his photographs (tigers preying on live buffalo) are highly exciting. Dr. Schaller deserves the greatest appreciation for his wonderful work which is as indispensable to the wildlife specialist in India as to the general reader.

H. Khajuria.

(With the publication of this book, the era of the sportman as the arbiter of wildlife destiny ends. A. A. Dunbar-Brander, for so long the undisputed "bible" of Indian Wildlife, is finally excelled by this scientific yet readable treatise.—Ed.)

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ELEPHANT PEOPLE by Dennis Holman

The Liangulu are the Elephant People of this book, a tribe a thousand strong living in the area which in 1957 was created the Tsavo National Park. Unlike other tribes of Africa the Liangulu had no lands and did no cultivation. They lived on whatever they made from ivory, sold to middle-men, of the elephant they shot with their big-bows and poisoned arrows. Little is known of these people who make a wonderful subject of study as an ethnic group. Mr. Holman pities their plight. However, in the book the author has sketched out the lives of some of the greatest of these ace-hunters, their areas, their methods of hunting and their pécadilloes.

The book deals exclusively with the efforts of Sheldrick, Woodley and Stevens and their Ranger forces which were able to bring an end to the poaching activities of these hunters. It was an Herculean task but was accomplished with efficiency.

The 8,000 sq. miles of the National Park was made safe from the de-pradations of the Liangulu and the Kamba poachers. In doing so the department had created a sociological problem for the now sullen and suspicious Liangulu. A year after the mopping-up operation the tribesmen were embittered and left without a livelihood. Also there appeared within the year an ecological problem for the area where a 'crash-kill' of 5000 elephants had been necessitated from the explosion of their population density. A necessary conservation measure of

controlling game through shooting was essential even in the Park if game was to survive at an optimum density.

Tsavo is a familiar name to most readers, made so through the pages of the book 'Man-Eaters of Tsavo'. The locale of the 'Elephant People' is this same area in Kenya. Sandwiched between the vast stretches of dry parched scrub are the two belts of riverine forest along the Athi and the Galano. It was in these that the heaviest ivory was found in all Africa. Only a few white men and their clients had been to it, otherwise it had been the preserve of the Liangulu poachers, who left behind on Woodley's count 1280 skeletons of dead elephant littered in a season. During the wet season, the game and elephant foraged all over the dry belt. The dry weather necessitated their migration into the denser and moist areas.

Mr. Holman at his clinical best gives us thorough details of the problem of poaching, its methods and its unfolding ramifications.

The underworld was well organized, whole communities were involved with the poachers in a complex of subsidiary industries and services that had grown up with the racket, in illicit trophies—poison making and selling, giraffe hunting, ivory portage and palm wine tapping. The last being, perhaps, the most paying since the tappers would undertake to keep the great hunters paralytic on their hunting expeditions.

Having studied the situation and made dossiers for each hunter with the help of defections, Woodley and his Voi Force of Rangers began swooping upon the bushmen's hideouts. This required bush craft greater than that of the poachers and toughness that came only through dedication in service and the work at hand. One by one the ace-hunters fell to Woodley's snares and were sentenced. The poachers' admission of crime were both stunning and revealing. The portrait gallery of the hunters was impressive of which no tribe could be prouder. Galo-Galo Kafonde, Abakunu Gumindi, Garisa Boje, Galao-Galo-Galo and Dara Bros. Having rounded up the poachers Woodley hit upon the most exciting of games, the treasure hunt of caches of hidden ivory. At the end Woodley broke the very pipe-line of supply to the coast. In a last desperate bid, in raids near Hadu, he broke even the crafty middle-men on the coast.

Throughout there are exciting accounts of hair-raising adventures of dangerous episodes with game and poacher. Finally in terms of cold statistics in one year Woodley collected 25,219 lbs. of ivory which was sold at Government auctions for £20,000/- plus the 1,000 lbs. of rhino-horn with leopard skins and other stuff accounted for the entire expenses of the campaign against poaching in the Park.

Somehow at the end of the brilliant operations of Rangers one is concerned with the Liangulu poacher, who lived his life dangerously in a violent world in which no law existed save the law of retribution, and only the fittest survived.

In the first place, their quarry turned on them—and you cannot stop a charging elephant with a poisoned arrow. Then the bush, too, took its toll: many hunters were lost on their trips dying of thirst; eaten by lions; horned by rhinoceros; bitten by snakes and so on endlessly. These very people who were to elephants what are a pack of dogs and predators to other game, were forced out of their way of life by the serakeli—the Government—and now knew no other livelihood. It is this problem that Mr. Holman is more concerned with “The Elephant will survive, but will the elephant people”? Mr. Holman’s concern is for them and their tragedy with its overtones that are so poignantly African. Though wild life comes in largely in the book, it is more about the story, a true story of these people the Liangulu.

No parallel of the problem of wild life conservation and poaching of the dimensions encountered by Woodley in Tsavo is existent in India. Yet it is a pity that even small time operations of panther and tiger poisoning are unable to be controlled. And the population of these animals is dwindling dangerously below the optimum density.

The book is exciting, revealing and very engrossing indeed.

R.D. Singh.

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TRYST WITH TIGERS By Sher Jung (Robert Hale, 1967.) Illustrated Rs. 26.25 Ps.

Divided into two parts, the first part of the book deals with the habitat, breeding, mating and feeding habits and other features of the tiger. Though an attempted rationale of the ecology of the tiger, this is impressionistic sporting lore, after the pattern of what we have read in sporting literature always. The jungle lore is brought up-to-date, however, and the author acknowledges having drawn liberally from the famed bibles of this *genre*: Best, Baker, Burton, Campbell, Corbett, Brander, Lydekker, Sanderson, Sterndale, Shakespear, etc.

The second part of the book, and the longest, is nostalgic reading, full of interesting and often exciting anecdotes, and accounts of tiger shoots in the *terai* areas of U.P. and elsewhere. The pictures are well-reproduced, but it is not clear whether they are taken in the forest or in zoos. It would have been better if they had been acknowledged and located in the captions.

A very readable book for the sportsman and not entirely without utility for the naturalist, a must for all libraries.

H K.D.

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READE, ELEPHANT HUNTER (Illustrated) By P.D. Stracey

Rightfully so, this book has been written by a friend (of the great hunter), who not only is well travelled in this elephant infested area, but is also one who has had the fortune to be amongst these gigantic beasts for a long time—as a *Khedda* officer.

This book is praiseworthy and can be called a sequence to the author's previous book *Elephant Gold*'.

It suggests mainly a tribute to a great hunter Reade, who unfortunately has not gained any publicity. Stracey calls him the Corbett of the elephants. A modest retiring and energetic man, as described in this book, Reade has to his credit over 200 elephant kills, over a period of forty years. Nearly all of this total has included trouble makers—rogues or crop raiders which were proclaimed for destruction by the Government. It was Reade's good fortune of being an agricultural officer and crop protector that he combined business with pleasure.

The character of this extraordinary personality come out very clearly in the episodes described by Stracey pertaining to elephant hunts. Firstly, Reade was an absolutely fearless person and must be praised for his courage—which of us ordinary beings would continue to hunt down elephant in the similar manner, after having had as many as three narrow escapes at the start of our careers? Reade was nearly as good as dead on each of these three occasions. However, he cared not for his wounds and did not seem to associate fear with them. The irony in these escapes was that in lieu the elephant concerned always killed another man who was accompanying Reade, most unexpectedly.

As is the case with all great hunters, Reade had his variety in modes of shooting—he at times killed stone dead with a single shot while at others the elephant remained in prolonged agony, refusing to die after many shots. Reade did not hate all elephants though he treated all troublemakers as his enemies.

Stracey has planned this book well and has provided for the reader entertainment value as well as historical and other interesting knowledge. The book gives you a wide knowledge of elephant ways and the ways of the elephant people—the Khasis. It would be rather sufficient as a guide to a history student on Assam as well as on the geography. In it are cleverly blended, interesting beliefs, customs and superstitions of a fast dying race of people: of legends and sacrificial rites and other forms of a unique culture. A detailed account of all the major ceremonies of the Khasis is available and has been put forth in an interesting manner.

The book is not wholly confined to Reade and the Khasis. Various incidents of unique hunts and narrow escapes in the lives of other famed elephant hunters are related as well as Stracey's personal experiences. Shadwell and Mackrell all play parts in this book.

Towards the end of the book Stracey strays from the previously strict confines of elephants where animals were concerned and goes to mention Reade's reminiscences with the other jungle folk—mainly carnivorae, of Reade's having seen proof of the tiger migration, of a race of small pigmy deer, of a tiger having killed, contrary to Corbett's words, 11 cows in one go and much more. Also interestingly, the birth of an elephant is described as well as Reade's elephant hunting know-how: how you can make out a male from a female elephant by watching its urinary behaviour; and how you can tell a tusker from its call. Reade also reports having seen a dwarf tusker, six feet tall and with heavy tusks which he thought was a species of its kind !! Two incidents of an elephant being stunned for a long time and having been believed killed, and not found at the spot the next day have also been described.

The book is informatively illustrated and even though many of the pictures do not pertain directly to it they add to the interest. In the illustrations are also included some shots taken by Reade, of a charging elephant which he shot a moment later.

The book on the whole is highly entertaining and informative of Assam and elephant behaviour in general. It is a book recommended for all those who wish to spend an entertaining few hours, or acquire knowledge of the elephant and those who hunt them.

Karanjev Singh.

Students' Corner:

We have heard with great pleasure of the foundation at Shillong of the Shillong Wildlife Club by a group of teenagers, headed by Bobby Das, of Stoneylands, Shillong-3. They publish a monthly newsletter called 'The Gazelle', which they plan to re-name 'The Egret' soon. We congratulate them, and offer all possible help in their pioneering task.

The Doon School Wildlife Society, we believe, has sent them a message, and offered them other help.

The formation of such clubs all over India would be the revolution we are all waiting for with folded hands.

A student member writes from M.P.:

I would like to give you a brief report on the wildlife in the Pamakheri Shooting Block (North Khandwa Division) in Madhya Pradesh:

The wildlife is fairly abundant, especially nilgai, large herds of which were seen frequently. A few herds of sambur and chital were also seen, though it was evident that they were not as abundant as they should have been. I was sorry to see two maimed sambur and chital

hinds, covered in blowflies, and limping. They had apparently fallen victims to the local shikari's muzzle loader. Also in abundance was the 'Bhedki', the innocent 4-horned antelope.

The block is excellent tiger country, hilly, with several ravines and waterholes, where tiger could be expected to lie up during the day. Pug marks of one large panther and of two pairs of tiger were seen. I also saw one small panther at a waterhole.

Carnivora is not as abundant as it should be, since all their requirements, i.e., food, water and shade, are plentiful. They have either been shot up, or have crossed the Narmada as man has disturbed them by destroying the forests and cultivating the land.

I hope some action will be taken to stop the mass wood cutting in the area. This will greatly help in improving the wildlife conditions here. It is a pity that this area will be submerged within four years, due to a dam under construction on the Narmada; it would be better to convert this block into a Sanctuary. I hear some proposals about this are being considered, and I hope they materialise.

Yours etc.,
Kamal Prasad

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AN INDIAN PROFESSION WHICH HAS VERY NEARLY PASSED AWAY

There was a time when man hunted with the falcon, yes—a time when he would adventure into the deep valleys of Kangra, the extensive wheat fields of the Punjab or the rugged hills of Peshawar to come back with quail, partridge or hare, got by this magnificent bird of prey which quietly sat on his right fist—observing the countryside with a crystal eye. Yes, those were the times of Kipling, of Ranjit Singh; those were the times when man hunted without arms for food—for a living. Now all the past is dust and except for a few falconers the sport and profession are extinct. The Goshawks roam the Kangra valleys, the sparrow hawks the Punjab, the golden eagles the cliffs of Kumaon, and the Peregrine the prairies of Africa—all unhindered.

Falconry, though, is a magnificent sport. I would like to relate the falcon's training, its habits and its life while in the care of a falconer, because I do have some personal experience since my family are regular falconers.

Firstly, the people of the tea estates in the Kangra valley observe the habits of a group of falcons and then spread their nets across the narrow abysses through which they fly. A Goshawk or sparrow hawk taken unawares and flying at a great velocity is trapped in the net, is secured and sold to the trainer. The hawk has to be below the age of six months or it is impossible to reclaim it. In Africa, though, the catcher buries himself in silica sands of the

outer veldt and lures the hawk with a live partridge. As soon as it has made its kill he envelopes it with a light tarpaulin.

The trainer now has the most nerve-racking job. First he must make the falcon feel at home in a house by stroking and kindly feeding of live bait. Then for two weeks he carries him continually on his fist in the midst of blaring horns of automobiles and turns his gramophone or radio on full blast at home to sort of 'gentlemanize' the bird. Then the worst is over.

Now come the practical lessons. With string attached to foot of hawk, he throws at a distance, increasing as the time goes by, a live partridge, at which the hawk must fly within a certain time limit and kill within a fraction of a second. Then, as a dog is trained to answer to a whistle, the hawk is taught also to answer to a particular bellow. In the time of Kipling every family had its own unique call. For example, the French Indians said "ooo-la-la-laaa", the Punjab Muslim "Heeerya", and the English "Lovely". Some called the hawk by its name. After this it is up to the trainer to teach the hawk to kill. Now the hawk is in his hands. The training is complete.

There are, of course, rules, precautions and traditions concerning hawking and falconry. One silly tradition of the British is that every hawk must learn to wipe his beak after a kill, on the word "Feak" which means "clean your beak". The Arabs believe that if a cyst forms on a hawk's eye they must slice off a piece of flesh from a pure-bred horse's thigh and squeeze it on the eye of the hawk. The French-Indians believe that if a falcon is ill, which is detected by the excreting velocity of waste matter, they must chop off the head of a snow-white cock and give the falcon its blood. The Indian belief, which is now universal medicine, is that the hawk's illnesses are mainly due to its abdomen and so it should be given some clover. These of course are only trivial blemishes which arise with every sport and profession.

The hawk's work also depends on the falconer himself. A true falconer can be recognised at once by his lynx-like eyes and their far-away look—always searching and observing, his walk and his hard features sometimes betraying aquilinity in India but more of marred handsomeness in Africa. He will also be callous and cool through all emergencies and handle them as his hawk would its prey. A falconer must know his hawk, he must watch its eyes, its head, for any signs of prey recognition. Nowadays there are very few falconers. Prince Osman—a Dehra Dun dweller—is extremely interested. My father now still roams the woods, for his job has brought him in contact with it. He is quite at home in the foothills of Darjeeling in West Bengal. There are a few hawkers around Jullundur also, in the Punjab, but very rarely do they make excursions from their absorbing business errands. In Persia, in Pakistan, this profession has, as everywhere, become a sport where the old Maharajas carry it out with much zest. In Britain I know of only one falconer—James Robertson Justice. He

loves the Goshawk and the peregrine falcon and, as his acting brings him only at odd intervals in slavery to the theatre, he has about the most freedom and enjoys himself amongst the bagpipe-echoing hills of Scotland. Now he is employed in teaching Prince Charles hawking – I am not sure as to whether he enjoys that very much. In Africa there are many falconers, especially around the Union of South Africa Tanzania and Kenya

There is many a delight in hawking. In this work-a-day world there is nothing better than for a man to probe into the forested woodlands amidst the sweet smell of myrtle in Britain, among conifer and pine in India and over the 'lone prairie' in Africa. Hawking gives one a home where the 'buffalo roam' and the 'bear and the antelope play' (as a 'hill-billy' would say). It is a nice sport, which although almost extinct, is now reviving with the urge of man for adventure. Unlike stamp-collecting, coin-collecting and so on it takes one's mind away from the roar of guns, the gloomy cavalcade of war, and the cussedness of politics. It certainly ought to be revived.

So, in a nutshell, this is one profession which I regret has passed away—one profession that has done no harm to the world—but yet fallen to the dust in the aeons. I hope that on disarmament, which is probably a vain hope, it will again revive.

Vikram K. Bedi

(15 years 9 months)

Sherwood College,

Naini Tal.

A Visit to Corbett Park:

My parents took me for a week-end trip to Dhikala from New Delhi. It took us five hours to reach in our Fiat. We stayed in the Dhikala rest house. It was very expensive.

The next morning, Mr. Negi, the Assistant Wildlife Warden, told us that the tiger had killed the *padma* and would be lying up and would be beaten out of grass. We went on foot, and then on the back of an elephant, and sat down in a machan on a tree only two miles from the rest house. Two more elephants drove through the tall kans grass below us, and the tiger growled and charged out across the cutting of the grass. We saw him clearly for some minutes.

We then saw wild elephants, *paras: kakar*, pigs and chital in great numbers. I liked Corbett Park very much and would like to go there again.

Triloki Nath, age 12 years.

From The Sanctuaries:

Nandankanan, Orissa's Biological Park, is being modernised. The number of visitors to it, especially visitors from abroad, is increasing annually, and four tourist lodges have been built to accommodate them. The road from Bhubaneshwar is 27 km. all-weather, and from Cuttack it is 24 km during the fair weather only.

Kaziranga:

Thirty-seven rhinoceros are said to have been killed by poachers in the Kaziranga sanctuary during 1967. The International Union for the Conservation of Nature and Natural Resources has analysed samples of rhino horn and found it to contain no known aphrodisiac component, but the prices fetched by rhino horn continue to be high, motivating such poaching.

Point Calimere Sanctuary, Madras State:

The population of blackbuck in this valuable stronghold of this species in South India is reported by Mr. J.C. Daniel, Curator of the B.N.H.S., as being of the order of 800 animals. The sex ratio is said to be 54 males for 100 adult females.

Rajaji:

This sanctuary has been enlarged to become contiguous with Motichur Sanctuary, giving a large expanse of uninterrupted sanctuary to wildlife. Its potential can be developed greatly if a view of tiger can be assured to the thousands who flock to the hill-station of Mussoorie beyond the Shiwaliks.

Corbett Park:

Hundreds of visitors in the past winter season have been shown tiger, hundreds of chital, some wild elephants, hog deer, barking deer, pig and panther. This is looking up as a tourist resort and it is planned to build additional accommodation attached to the existing rest house.

From the States

Assam:

Wild elephants have been causing a lot of damage in Cachar areas of Assam, where crops, forest lands and village property is being destroyed, following the great increase in the number of these animals, unchecked by shooting or catching.

Twelve persons of village Bansdhoa who had gone to the forest for collection of firewood were suddenly attacked by five Rhinos of Patlakhaoa Forest. While the others ran away, one was horned to death on the spot. After the 1954 floods which destroyed the forest rhinos disappeared from this area. As killing of rhinos is prohibited by law this sudden influx of rhinos has created a panic in that locality.

Sardar Ajit Singh, a noted shikari, destroyed a tusker rogue elephant at Tokapathar, Khatangpani some fifteen miles from Digboi in December, 1967. The rogue had caused much damage and had killed three people.

Half a dozen rhinos, with a three-month-old calf, have established a new rhino area in Assam in marshes just across the river Brahmaputra within ten miles of Gauhati.

These animals are believed to be immigrants to the marshes, north of Gauhati from the Orang and Laokhoa Reserves, about 50 and 70 miles up the Brahmaputra respectively. In both those reserves there are small rhino populations.

Bengal:

The depredation by wild elephants in Western Dooars is continuing unabated. A number of tea gardens in the area were seriously afflicted and 4 workers were killed by elephants. There was panic prevailing among labourets of the estates.

Both Mr. B.B. Nag and Mr. D. P. Roy, managers of Ramjhora and Makrapara tea estates said that many plantation areas including trees and seasonal crop lands were damaged by the elephants. They said that the Forest Department was requested to take steps.

A Press Conference was addressed by the "Vice-President" and the "General Secretary" of the "Wild Life Preservation and Game Association" at Calcutta on the 3rd February, 1968. The objects of this association, according to the speakers, are publication of journals (sic) and the holding of seminars. No response has been received to your Editor's letter to them yet, offering our help and co-operation. We look forward to hearing more of this.

The East Pakistan authorities have decided to undertake effective measures to afford protection to the tiger population of their area, which is rapidly declining. No details have

been received in response to your Editor's query yet, but it is believed that World Wildlife Fund experts have drawn up an effective plan to save the estimated 2800 (?) tiger still surviving there.

Several shikaris have been granted licence by the forest authorities to hunt down the man-eater that had taken a toll of three lives in the Mong Pong area of the Kalimpong reserve forest. The police are also on the look-out for the tiger.

The man-eater's pug marks suggest that it is an outsider to the forest's carnivora population and is probably the tiger which received crippling wounds in trying to free itself from a boar trap some time ago in the Apalchand forest.

A Santal of Benguakhali in Sagar island of the Sundarbans found silver ornaments on opening up the stomach of a crocodile killed by the villagers. This must be the ferocious, man-eating *Crocodylus porosus*, or Marsh crocodile.

An estimate of yearly man-eating by the Sundarban tiger must fall far short of what has been happening during the past few years. The Forest Department does not publish the figures of man-eating for fear of a public outcry. To the number that come to light now and then must be added the toll taken by the tiger off those who go to the jungles behind the back of the Department without any kind of permit, almost regularly. I heard of 28 casualties reported during the honey season at a single Forest Station some two or three years ago, and there are many such Forest Stations, my estimate is 300 per year. During the past two years tigers have been bold enough to swim on the anchored boats to take their victims.

The Sundarban tiger will not be exterminated so long as there are jungles there—jungles which it is normally impossible to beat. All tigers in the Sundarbans are man-eaters, actual or potential. The best that can be done is to keep their numbers down by taking steps to eliminate as many of them as possible.

There are many sportsmen willing to take the risk but they need encouragement and co-operation from the Forest Department.

Plenty of poaching goes on in the Sundarbans but the nature of the terrain makes it impossible for the Forest Department to stop it.

Delhi:

A customs official approached the Director of the Delhi Zoo for identifying 16 pounds of hair said, by the exporter from whom these were recovered, to belong to the Vrindaban Deer, a species never before heard of. Dr. K.S. Sankhala was able to identify them as the tails of *chinkara*, the Indian gazelle which has been on the prohibited list in Rajasthan for seven years.

It transpires that exporters, whether of these tails, snow leopard skins or other rare trophy items, often bank on the lack of expert knowledge of the customs authorities to export prohi-

bited items. In future such reference to experts should be made in all cases where there is doubt.

Gujarat:

The Gujarat government forest department will conduct a census of the lion population of the Gir forest in April. Compressed-air guns firing dye-capsules to facilitate identification and avoid duplicate counting, as well as tranquilliser-gun equipment has been imported specially for this. At the last count, 290 was the number quoted as the population of Gir lions.

Dr. Neil Todd of the Harvard Medical School worked in the Gir on the social behaviour of the lion. He collected twenty lion skulls for further examination at Harvard, but it is not explained how these skulls were obtained. Presumably they were old, abandoned skulls of lions that died natural deaths or were killed before shooting and poaching were effectively stopped. Dr. Todd used sexual-scent-stimulants, chemicals that persuaded lions to emerge from the thickets for his study. This ingenious method may be used again in this approaching census.

The government also intends to resettle, 1,200 maldharis, and their 20,000 sheep and cattle, elsewhere, and to increase the area of the Gir sanctuary from the current 495 square miles to 1,500 square miles.

A lion mauled two persons on the outskirts of Majapur village in Junagadh, when a crowd tried to drive back to the forest half a dozen lions strayed from Gir.

Mr. Dalvi, Conservator of Forests said he could not confirm reports that the lions had gone back to the Gir Forest Sanctuary, which is about 12 miles from Majapur village.

The first to sight the lions were some labourers who tried to frighten the animals away by shouting. Later, a crowd collected and began throwing stones at the lions, one of which pounced on the attackers. The lions were later reported moving towards the forest.

The State Wild Life Advisory Board has drawn the attention of the Government to the dangers faced by the wild ass of the Rann of Kutch. Their numbers are estimated at between 250 and 1,000, but no census has been taken. Mr. Reuben David, Superintendent of the Ahmedabad Municipal Hill Garden Zoo, is trying to breed the three in the zoo to build up a breeding stock in case of threats to the natural herds of the Rann. It appears that the Indo-Pakistan conflict in 1965 directly or indirectly led to the death of several of these animals.

Haryana:

The Lakhi Dar, Haryana's famous black buck herd, is being run down. This is perhaps the last of the large herds that were once common all over northern India.

Its depletion continues despite the fact that the buck is declared a "protected animal". The unscrupulous jeep-mounted sportsman with automatic shotguns, however, is no longer its

only enemy. In the past, local poachers were kept in check for fear of reprisals from a largely vegetarian populace which looked askance at any form of shooting.

But now even this slight "protection" is no more. Districts like Hissar and Rohtak are rapidly becoming non-vegetarian and the petty poacher has little to worry about. If nothing is done to put a halt to this decimation the herd will have vanished altogether by the mid '70's.

Kerala:

A 170-acre island in the Neyyar Wild Life Sanctuary in Kerala, is to be developed into a deer-park.

A batch of five samburs was released into the island last evening by State Forest Minister M.K. Krishnan.

The 50-mile sanctuary situated in the catchment of the Neyyar reservoir, 18 miles from Trivandrum, does not have much of wild life population at present.

Attempts are made by the State forest department to populate the sanctuary by artificial introduction of wild animals so far, have met with some measure of success.

Madhya Pradesh:

According to a news-report, President Tito of Yugoslavia, when he visited India in January this year, was treated to a tiger-shoot in M.P. under the overall supervision of the Chief Minister.

Maharashtra:

Mr. Humayun Abdulali is attempting a count of tiger in India. He has invited *shikaris* and others living in areas of Maharashtra where the tiger still survives, to communicate with him C/o The B.N.H.S., Apollo St., Fort, Bombay, so that he can collect such first-hand information as can be gathered to be able to arrive at an estimate of the tiger population less impressionistic than the range of between 4,000 and 6,000 which is widely accepted.

The Wild Life Preservation Officer, Poona, in a circular issued, states that no permission is required for destruction of wild animals and wild birds causing serious menace to human life and property.

As per the provision of section 50 of the Bombay Wild Animals and Wild Birds Protection Act the killing or capturing of any wild animal or bird by the occupant of any land, in defence of the standing crop or cattle on the said land or in defence of himself or any other person is permissible. The trophy (animal killed there of) should however immediately be handed over to the nearest Forest Officer or Police Officer

This will facilitate villagers in destroying wild animals, or birds, without seeking any permission.

Mysore:

Rani, a Great Indian Rhinoceros at the Mysore Zoo, gave birth to a calf in February, a note so common case of successful breeding of this species in captivity.

A *khedda* or beat leading to the capture of wild elephants for training and domestication was organised by the forest department of Mysore in January this year in the 250 square miles of Kakanakote forest. Revived after a lapse of 8 years, the last *khedda* having been organised in 1961, this *khedda* was tourist-oriented, visitors having paid one hundred and thirty dollars for watching and filming the operations.

About sixty-five elephants were captured. Details of expenses are not known, but it is believed the Mysore forest department is not likely to incur a loss on the operation, what with sale of the elephants after training even at poor prices and the receipts from tourism.

The *khedda* is derivative from the sanskrit, 'khid', to terrify, to frighten, and means to drive, hunt, chase, pursue as in 'khedna'. It was G.R. Sanderson who modernised and perfected the art of the *khedda* in Mysore in 1873, though Sultan Haider Ali had tried it earlier, in the 1750's.

A second *khedda* was held in the Kharapur forest on the 14th of January, when 40 elephants were captured. There was considerable confusion attending the efforts of cameramen and others keen to get close to the proceedings, but the entire organisation was well-planned. It is reported that 4,000 people watched the *tamasha*.

A herd of wild elephants is reported to have killed a 35-year-old person, a 12-year-old boy and a 10-year-old girl near Alur, in Hassan district, on January 11th.

The elephants first trampled to death a villager who was asleep near a paddy field and destroyed paddy crop. The herd moved to another village and killed a boy and a girl leaving their mother and a child unhurt. Another injured person has been admitted to hospital.

The police, who were alerted, are understood to have driven the herd into the interior of the nearby forest.

Rajasthan:

In reply to a question tabled in the Vidhan Sabha, the Forest Minister of Rajasthan, Mr. Narain Singh Masuda, declared that the population of "rare species" like *chinkara* (*Gazella gazella*, Pallas, 1766), and blackbuck, (*Antelope cervicapra rajputanae*, Zukowsky, 1927), is continuously declining in the State because of unauthorised shooting! We are glad that the Hon'ble Minister is so well-informed, and that he enlightened the august Chamber.

Fresh orders under the Forest and Wild Life Act have been issued by the Government of Rajasthan, declaring blackbuck and the four-horned antelope completely protected animals. What steps will be taken to give effect to these orders are not enumerated.

Uttar Pradesh:

A man-eater has recently been killed by a villager in a nearby village in Garhwal, Dogadda, district.

The tiger had turned man-eater near Dhikolya village about 30 miles from here and had killed a village woman in the forest while she was cutting grass.

The Lucknow zoo now has a solitary male Golden Langur, *Presbytis geeii*, which was acquired from an animal dealer unaware of the rarity of this species, which is found only on the border between Bhutan and India, up the Manas river.

Correspondence

Sir,

..... We need not penetrate into the jungles to cite instances of cruelty to animals. On our roads daily we see the tonga-horse, the bullock and the donkey being beaten and mistreated. Many animals are in such a sorry state that in any western country they would be destroyed or committed to the sick-bay. But sick, sorry or dying, here they must work.....

C. G. Crawley,
Jaipur.

February 4.

* * * *

Sir,

The incidence of poaching of rare species of animals and birds is increasing every day in spite of the curbs imposed by the Government.

A spokesman of a Delhi firm which deals in animal hides and by-products disclosed that musk worth approximately Rs. 2 lakhs is exported every year. The killing of musk deer, a vanishing species, was banned by the Government some time ago.

According to the calculations of the spokesman one musk deer fetches musk worth Rs. 300 approximately. About 666 musk deers, therefore, are killed every year for the export of musk.

Though the firm has reportedly suspended the export of raw musk due to the curbs, it is exporting the rate item in a powder form mixed with other synthetic substances.

Yours etc.,
T. N. P. Singh

* * * *

Sir,

Please refer to your editorial note on page 13 of Cheetal, Vol. 10, No. 1, regarding pea-fowl eating eggs of red jungle fowl.

My suggestion is that some 10 or 20 nests of red jungle fowl containing eggs be located and watched day and night by some of us. 8 hour duties should be fixed. May be, we are able to verify the marauder as pea-fowl. I invite your ideas on this suggestion.

Personally I think that this is an alibi for shooting pea-fowl for its tasty meat which is our National bird and protected.

Gurukul Kangri,
Saharanpur, U. P.

Yours faithfully,
Pratap Singh

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Sir,

We draw your kind attention to the article of Mr. P. D. Stracey, published in October No. of your magazine. In the said article (at page 30), the author has remarked as follows:

"It was reported sometime ago that Tigers in Mysore and Madras were being poisoned by the pesticides supplied to cultivators and that their skins were finding their way to the workshops of the local taxidermists."

We do not know how the author supports his contention and from where he has received such reports. So far as South India is concerned and in particular Mysore, we are the only firm of Taxidermists with a standing of nearly forty-five years and we have not received or made arrangements to receive tigers killed by the cultivators. We are afraid that the general remarks passed by the author give an impression that we are also parties to these acts.

There have been some cases in Mysore where the cultivators have poisoned tigers by using Folidol and that only in cases where the tigers were causing extensive damage to the cattle in the locality. This by itself cannot mean that the Taxidermists are hand in glove with the cultivators and that the Taxidermists are securing the tiger skins in the surreptitious way.

In all fairness to us and to our standing in the field, it is necessary that the general remarks passed by the author of the article should be expunged. Will you please take some action in the matter?

Mysore.
17th January, 1968.

Yours etc ,
Van Ingen & Van Ingen
Artists in Taxidermy

[We are sure that no direct reference to the excellent firm of Van Ingen and Van Ingen was intended. We are forwarding the letter to the author.Ed]

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Sir,

With reference to your No. 424/XVII of the 20th January 1968, forwarding copy of a letter from Messrs Van Ingen and Van Ingen, Taxidermists, Mysore protesting against my remark in an article on the future of the tigers (Cheetal) that tigers were being poisoned in Mysore and Madras, etc., permit me to express my surprise at the stand taken by the firm. (I am well acquainted with them and would be the last to suspect them of any nefarious practices.)

Their letter itself indicates that such unfortunate occurrences as poisoning of tigers by insecticides have taken place in South India and it is quite possible that the skins of such animals have found their way to taxidermists in that art of the country. But even if the latter were aware of how the animals were killed, how could they help it? There seems no necessity to read into my remarks an innuendo which was not meant.

Yours faithfully,
P. D. Stracey

4th May, 1968.

* * * *

Sir,

It has been reported that some, if not all, of the explosives used by alleged saboteurs against the Government Secretariat and Deputy Commissioner's Court Buildings in Shillong were of the normal kind used for rock blasting, road making—and therefore bombing of fish in the rivers.

For many years now I have been trying to draw the attention of the Government and the public, through the media of the press, the radio and platform, to the wholesale and totally illegal slaughter of fish in the rivers of northeast India (and of other parts of India also). I have made repeated written and verbal appeals to senior persons of the Government, Armed Services, Public Works Department and others, in order to try and stop this unauthorised leakage of explosives and their illegal use against fish, which is a valuable natural resource and supply of protein food.

It seems amazing that far fewer than one per cent of the population should be allowed to destroy illegally masses of fish with explosives, while far more than ninety-nine per cent of the people (included among whom are many peace-loving rod-and-line anglers) do not indulge in this wanton and wasteful act. It is clearly laid down in the Indian Fisheries Act, Section 4 (1): "If any person uses any dynamite or other explosive substance in any water with intent thereby to catch or destroy any of the fish that may be therein, he shall be punishable with imprisonment for a term which may extend to two months, or with fine which may extend to two hundred rupees".

From all accounts it seems now that the leakage of explosives from the store rooms of the Armed Services, or Public Works Department, or State Electricity Board or some other public sector concern has enabled certain persons to resort to acts of sabotage against Government buildings. I earnestly appeal once more to those in authority to prevent the unnecessary leakage of explosives and to ban the unauthorised possession, selling, giving and carrying of explosives for any anti-social purpose whatever.

Yours etc.,

E. P. Gee,

Member, Indian Board for Wild Life, etc.

Upper Shillong, Assam.

November 22nd, 1967.

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Sir,

In this International Tourist Year Kaziranga, with its diamond jubilee approaching, is in the news again. But most unfortunately the place is still only a wild life sanctuary in spite of having been very widely acclaimed as a very fine potential national park. (The difference, of course, between a sanctuary and a national park is that the former is simply notified by a Government Notification and therefore is only temporary and can be easily un-made, while a national park is constituted by an Act of the Legislature and is therefore permanent, of much higher status and can only be altered or alienated by the Legislature.)

The national parks of north America and Africa are world-famous and attract many millions of tourists. Those of Europe and some other parts of the world also have considerable visitor attraction. Having myself visited national parks in many parts of the world and realizing their importance as tourist attractions as well as a means of preserving the country's fauna and flora and superlative scenery, I have been continually advocating the up-grading of Kaziranga and Manas Sanctuaries of Assam into national parks for the last twenty years. I first wrote in your esteemed paper about national parks for Assam as long ago as June 27, 1948, and have contributed many articles on the subject. But nothing has so far come of my appeal.

In 1953 I assisted Mr. P. D. Stracey, then Senior Conservator of Forests of Assam, in drafting the Assam National Parks Bill, and the then Forest Minister was intending to introduce this Bill in the Legislative Assembly. But somehow it was postponed and has remained "pending" ever since then. The Indian Board for Wild Life drew up a "Model" National Parks Bill to assist State Governments in enacting their own legislation for up-grading approved sanctuaries of national significance as national parks, and I helped in this work. This "Model" Bill was finally approved by the Union Law Ministry and by the Government of India, and was circulated to all States—including Assam—in February 1957.

In December 1963 the Indian Board for Wild Life officially approved of Kaziranga and Manas Sanctuaries of Assam, together with six or seven other sanctuaries of India, as outstanding wild life places of national significance and recommended their up-grading into national parks. This recommendation was approved by the Government of India and sent to all State Governments—including Assam. But nothing appears to have happened so far.

I appeal to the people of Assam and to the Government of Assam not to delay any longer in drafting and passing the necessary legislation for constituting Kaziranga and Manas Wild Life Sanctuaries into national parks, so that they may take their rightful place among the national parks of the world.

Upper Shillong.

November 24th, 1967.

E. P. Gee,

Member of the Indian Board for
Wild Life, and Member of
National Park Systems Planning
Committee of the International
Union for the Conservation of
Nature, etc.

FORM IV

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|---|-----|-----|---|
| 1. Place of publication | ... | ... | 7 A, Astley Hall, Dehra Dun. |
| 2. Periodicity of its publication | ... | ... | Bi-Annual. |
| 3. Printer's Name | ... | ... | Tara Chand Sharma. |
| Nationality | ... | ... | Indian. |
| Address | ... | ... | Dun Printing House,
27, Rajpur Road,
Dehra Dun. |
| 4. Publisher's Name | ... | ... | Hari Dang. |
| Nationality | ... | ... | Indian. |
| Address | ... | ... | Wild Life Preservation Society
of India,
7 A, Astley Hall, Dehra Dun. |
| 5. Editor's Name | ... | ... | Hari Dang. |
| Nationality | ... | ... | Indian. |
| Address | ... | ... | The Wild Life Preservation
Society of India, Dehra Dun. |
| 6. Names and addresses of individuals
who own the newspaper and
partners or shareholders holding
more than one per cent of the total
capital. | ... | ... | The Wild Life Preservation
Society of India, Dehra Dun. |

I, Hari Dang, hereby declare that the particulars given above are true to the best of my knowledge and belief.

Dated : 6th Nov. 1963.

Sd, Hari Dang
Publisher

Wild Life Preservation Society of India

HONORARY SECRETARY'S REPORT, 1966-67

The Society continues to progress steadily.

Membership

New Patrons and Members continue to join the Society and swell the ranks of wild life enthusiasts determined to succeed in their objective of preserving our national wild life heritage for generations to come. If each one of us secured just one new member we could progress fast.

New Members during the year

1. Life	9
2. Ordinary	23
3. Professional	8
4. Educational	5
5. Family	1
6. Student	143

Cheetal

We are bringing out a bigger and better 'Cheetal' and this increases the cost of publication but the satisfaction is that it is a more useful "Cheetal" now. It is growing from strength to strength.

Revenue Account

The Auditors' Report, the Balance Sheet and the Income and Expenditure account now before you show a deficit of Rupees 3,253.02, out of which Rs. 2,303.61 represent the amount written off from the membership subscription due from members for a period of more than three years. Efforts are being made to recover this amount. The assets of the Society have increased from Rs. 24,557 to Rs. 26,475.70 during the year.

Library

The Library and the Reading Room are being increasingly utilised. More books are being added to the Library through donations and purchase and some journals are exchanged for the 'Cheetal'.

Research Programme

The Research Programme is held up for want of funds and equipment but some progress has been made in the Himalayan Wild Life Research Project and the Black Buck Project.

During the current year the research programme of the Society will be activated and the educational programme strengthened through the Cheetal and other publications. Members of the Society continue to carry the message of Wild Life conservation to the people through the press and the platform and an audio-visual programme will be started if funds permit.

The Society is grateful to its Members and specially to the President H.H. Maharaja Sir Pratap Singh, Malavendra of Nabha who has freely given his time and helped the Society financially whenever there was need.

AUDITORS' REPORT

June 8, 1967.

The President & Members,
Executive Committee,
Wild Life Preservation Society of India,
Dehra Dun.
Gentlemen,

We have audited the Accounts of the Society for the year ending 31st March, 1967, and, as mentioned in our certificate at the foot of the Balance Sheet, we have the following report for your information:

2. The working of the year shows a deficit of Rs. 3,253.02 (after adjusting the loss of Rs. 830.50 from "CHEETAL" publication) as compared with the deficit of Rs. 758.00 (after adjusting the loss of Rs. 1,236.00) of the previous year. Thus there is a Net Increase of about Rs. 2,500.00 which is chiefly due to the following:

INCREASE IN EXPENSES:

	Rs.	Rs.	Rs.
Salary of Staff	450		
Rent and Taxes	250		
Amounts written off (Subscriptions, etc.)	2,400	3,100	

ADD: DECREASE IN INCOME:

Greeting Cards, Nature Games, Buttons, Badges,			
Ties, Pads and Covers	400		
Miscellaneous Income	200	600	3,700

LESS: DECREASE IN EXPENSES:

Honorary Secretary's Conveyance Allowance			
(Paid for 14 months in prev. year)	100		
Printing and Stationery	100		
Travelling Exp. for IUCN Meeting	100		
Audit Fee	50		
Loss on 'CHEETAL'	400		
Entertainment	250	1,000	

ADD: INCREASE IN INCOME:

Interest on Fixed Deposits	100		
Unclaimed Liability for Books written off	100	200	1,200

INCREASE IN DEFICIT: About

2,500

3. Accounts of Bihar and Assam Regional Branches have not been received, as reported in the previous audit report. Subscriptions demand recoverable from members of these branches be adjusted back if the Branches are not sending the accounts.

4. In Annexure 'B' attached to the Income and Expenditure Account, under Pads and Covers, amount of Bills Outstanding on 1-4-1966, Rs. 288.00 includes Rs. 138.00 recovered in the previous year and adjusted in demand this year. Hence there is a loss in Pads and Covers.

5. ACCOUNTS:

There has been an improvement in the maintenance of the accounts of the Society and monthly abstracts of Receipts and Payments are prepared. We wish these monthly abstracts be consolidated in the Cash Book and Receipts and Payments Account drawn from the same or a separate Ledger be maintained in which monthly totals of receipts and payments are posted.

We thank the Secretary and the Accountant for giving us full co-operation during the course of the audit.

We remain,

Dehra Dun,
June 8, 1967.

Yours faithfully,
For M/s. P.N. Bahri & Co.,
Chartered Accountants,
Sd. P.N. Bahri, Partner,
Chartered Accountant.

WILD LIFE PRESERVATION

Balance Sheet as at

<i>Prev. year</i>	LIABILITIES		Rs.	P.	Rs.	P.
	Unpaid Expenses:					
	English Book Depot for Library Books	...	23	70		
	Due to Assam Regional Branch	...	124	42		
	Goyal Studios for Photo General Meeting	...	127	50		
	Dun Printing House for Greeting Cards	...	455	50		
	Pal Studios for Photo General Meeting	...	35	00		
	U.P. Urban Tax (1-10-65 to 31-3-67)	...	189	50		
	Salary Payable to Ex-clerk	60 00				
	Less: Deduction for advance refundable	35 66	24	34		
724	Audit Fee	...	150	00	1,129	96
	Advance Subscriptions:					
	Ordinary Members	...	66	50		
	Educational Members	...	54	00		
	Professional Members,	...	76	00		
256	Student Members	...	12	00		
26	'CHEETAL'	...	65	44	273	94
	Donation from H.H. Nabha for I.U.C.N. and R.R. H.H. Nabha for Patron Members:					
2,289	Advance Deposit: Last Balance	...			2,288	94
	Corbett Prize Fund:					
	Last Balance	...	1,071	22		
1,071	Add: Receipts during the year	...	8	78	1,080	00
2,000	Himalayan Wild Life Research Project:					
	(Sir Dorab Jee Tata Trust): Last Balance	...			2,000	00
—	Suspense Account:	...			6	00
	Loan:					
—	From H.H. Maharaja of Nabha for Lapel Badges	...			787	50
6,366	CARRIED OVER	...			7,566	34

SOCIETY OF INDIA, DEHRA DUN
31st March, 1967

<i>Prev. year</i>	ASSETS	Rs.	P.	Rs.	P.
	Office Furniture and Equipments:				
	As per last Balance Sheet	...	1,081	00	
	Add: Donations	...	3	00	
			1,084	00	
1,081	Less: Depreciation for the year	...	108	00	976 00
	Library Books:				
	Last Balance	...	1,083	00	
	Add: Purchased during the year	...	150	20	
			1,233	20	
	Less: Depreciation for the year	...	246	20	
			987	00	
1,083	Add: Donations	...	153	00	1,140 00
1,765	Cost of Camera Purchased from Donations for Himalayan Wild Life Research Project:	...			1,764 95
492	Cost of 13 Photos: (Donations)	...			491 65
	Advance Contribution to Bihar Regional Branch: (Adjustable on receipt of statement of accounts)	...			19 00
	Outstandings:				
	Bills for Pads and Covers		8	50	
	Bills for Greeting Cards		795	00	
	Bills for Lapel Badges		280	00	
	Bills for Advertisements		554	50	
			1,638	00	
	Subscriptions:				
	'CHEETAL' (including Rs. 53.00 outstanding for sale of old copies)		1,220	15	
	Ordinary Members		1,432	22	
	Institutional Members		120	00	
	Affiliated Members		240	00	
	Educational Members		236	00	
	Professional Members		222	00	
5,242	Student Members		42	00	
			3,512	37	5,150 37
9,663	CARRIED OVER	...			9,541 97

WILD LIFE PRESERVATION

Balance Sheet as at

<i>Prev. year</i>	LIABILITIES—(Contd.)			
6,366	BROUGHT FORWARD	...	7,566	34
Society Fund:				
As per last Balance Sheet		... 18,190	88	
Add: Donations: From H.H. Maharaja Pratap Singh Malvendra of Nabha:				
Nature Games	742 50			
Ties	288 00			
Buttons	56 25			
	<u>1,086 75</u>			
From M/s. Bird & Co., Delhi, White Printing & Art Paper (contra)	890 00			
Furniture (Ash Trays)	3 00			
Library Books	153 00	2,042	75	
Add: Life Members' Fees		... 1,350	00	
Admission Fees from New Members		... 590	00	
		<u>22,173</u>	63	
Less: Sales of Previous Year returned:				
Pads and Covers	3 00			
Greeting Cards	8 25	11	25	
		<u>22,162</u>	38	
18,191	Less: Deficit as per Income and Expenditure Account (annexed)	... 3,253	02	18,909 36
24,557	TOTAL	...	26,475	70

15, Rajpur Road, Dehra Dun,
June 8, 1967.

SOCIETY OF INDIA, DEHRA DUN
31st March, 1967

<i>Prev. year</i>	ASSETS—(Contd.)			
9,663	BROUGHT FORWARD	...	9,541	97
	Security Deposits:			
	Electric	... 40 00		
60	Water	... 20 00	60	00
	Stock in Hand:			
	'CHEETAL' Copies in Hand	... 1,378 00		
	Printing and Art Paper: (Bird & Co. Donation Contra)	... 800 00		
	Pads and Covers	... 37 84		
	Greeting Cards	... 106 48		
	Nature Games	... 1,070 10		
	Ties	... 180 00		
	Buttons	... 18 25		
1,647	Lapel Badges	... 273 34	3,864	01
	Cash and Bank Balances:			
	With Central Bank of India Ltd., Dehra Dun in Current Account	... 2,247 84		
13,187	Fixed Deposit with Central Bank of India Ltd., Dehra Dun	... 10,761 88	13,009	72
24,557	TOTAL	...	26,475	70

As per our separate report of even date addressed to the President and Members, Executive Committee.

For M/s. P.N. BAHRI & Co., *Chartered Accountants.*
Sd. P.N. BAHRI, Partner, *Chartered Accountant.*

WILD LIFE PRESERVATION

Income and Expenditure Account for

<i>Prev. year</i>	EXPENDITURE	Rs.	P.	Rs.	P.	Rs.	P.
1,078	To Salaries to Staff upto February 1967	...		1,530	81		
812	„ Rent and Taxes	...		1,071	50		
153	„ Electric, Water and Conservancy	...		118	17		
2,043				2,720	48		
700	„ Honorary Secretary's Conveyance Allow. (1-3-1966 to 28-2-1967)	...		600	00		
224	„ Postage and Telegrams	...		204	98		
486	„ Printing and Stationery	...		378	00		
	„ Entertainment:						
	General Meeting	...	306 00				
620	Others	...	66 20	372	20		
104	„ Travelling Expenses for I.U.C.N. Meeting	...		—	—		
—	„ Books and Periodicals	...		55	55		
32	„ Subscription to Bombay Natural History Society	...		32	30		
—	„ General Meeting Photos	...		35	00		
98	„ Bank Charges	...		92	00		
200	„ Audit Fee	...		150	00	4,640	51
	„ Miscellaneous Expenses:						
	Telegraphic Address Renewal	...		50	00		
	Repairs to Typewriter	...		18	00		
92	Other Expenses	...		39	03	107	03
13	„ Free Issue to Members:					—	—
	„ 'CHEETAL' Publication:						
1,236	Loss as per Annexure 'A' attached	...				830	50
	„ Amounts Written Off:						
	Ordinary Members	...		1,649	61		
	Professional Members	...		174	00		
	Institutional Members	...		240	00		
	Affiliated Members	...		240	00		
	Depreciation:						
	On Furniture	...	108 00				
262	On Library: Books	...	246 20	354	20	2,657	81
6,110							
	TOTAL					8,235	85

15, Rajpur Road, Dehra Dun,
Dated June 8, 1967.

SOCIETY OF INDIA, DEHRA DUN
the year ending 31st March, 1967

<i>Prev. year</i>	INCOME	Rs.	P.	Rs.	P.	Rs.	P.
By Subscription Demand for the Year:							
	Ordinary Members	...		1,884	00		
	Institutional Members	...		180	00		
	Affiliated Members	...		240	00		
	Professional Members	...		234	00		
	Student Members	...		918	00		
	Educational Members	...		222	00		
3,746	Family Members	...		25	00	3,703	00
„ Income from:—(As per Annexure 'B' attached):							
	Greeting Cards	...		392	12		
	Nature Games	...		8	10		
	Buttons	...		4	17		
	Lapel Badges	...		139	84		
				544	23		
Less: Loss on Sale of:							
	Pads and Covers	...	101	85			
816	Ties	...	5	00	106	85	437 38
„ Miscellaneous Income:							
	Bank Charges	...		13	55		
305	Postage and Packing	...		67	57	81	12
485	„ Interest on Fixed Deposits:	...				609	88
—	„ Unclaimed Liability Written Off:					151	45
758	„ Deficit:						
	Society Account	...		2,422	52		
	'Cheetal' Account	...		830	50	3,253	02
6,110	TOTAL					8,235	85

As per our report on the foot of the Balance Sheet.

For M/s. P.N. BAHRI & Co., *Chartered Accountants.*
Sd. P.N. BAHRI, Partner, *Chartered Accountant.*

WILD LIFE PRESERVATION SOCIETY OF INDIA, DEHRA DUN

ANNEXURE 'A'

'CHEETAL' Publication Account for the Year ending 31st March, 1967

<i>Prev. year</i>		Rs.	P.	Rs.	P.
	Debits:				
	Opening Stock on 1-4-1966	...	840	50	
	Subscription Outstanding on 1-4-1966	...	807	55	
	Advertisement Outstanding on 1-4-1966	...	225	00	
	Subscription Advance for 1967-68	...	65	44	
	'CHEETAL' Photo	...	17	25	
	Printing Charges	...	4,061	58	
	'CHEETAL' Postage	...	599	47	6,616 79
5,252					
	Less: Credits:				
	Sales and Subscription Receipts (including sale of old copies)	...	954	09	
	Postage recovered	...	36	75	
	Advertisement receipts	...	717	00	
	Government Grant for 'CHEETAL'	...	900	00	
	Subscription Advance received in 1965-66	..	25	80	
	Subscription Outstanding on 31-3-1967	...	1,220	15	
	Advertisement Outstanding on 31-3-1967	..	554	50	
	Closing Stock of 'CHEETAL' on 31-3-1967	...	1,378	00	5,786 29
4,016					
1,236	Debit Balance on 31-3-1967 (Loss)				830 50

Annexed to the Income and Expenditure Account.

15, Rajpur Road, Dehra Dun,

Dated June 8, 1967.

For M/s. P.N. BAHRI & Co., Chartered Accountants.

Sd. P.N. BAHRI, Partner, Chartered Accountant.

WILD LIFE PRESERVATION SOCIETY OF INDIA, DEHRA DUN

ANNEXURE 'B'

Statement of Accounts of Other Income for the Year ending 31-3-1967

Prev. year		Rs.	P.	Rs.	P.	Rs.	P.
	Greeting Cards:						
	Sales Receipts	...	393 75				
	Sales Returns	...	8 25				
	Outstanding Bills on 31-3-1967	...	795 00	1,197	00		
	Stock on 31-3-1967	...		106	48		
				<u>1,303</u>	<u>48</u>		
	Less: Printing Charges	...	543 00				
	Outstanding Bills on 1-4-1966	...	181 50				
442	Stock on 1-4-1966	...	186 86	<u>911</u>	<u>36</u>	392	12
	Nature Games:						
	Sales Receipts	...	27 00				
	Stock on 31-3-1967	...	1,070 10	1,097	10		
	Less: Donation from H.H. Maharaja of Nabha	...	742 50				
5	Stock on 1-4-1966	...	346 50	<u>1,089</u>	<u>00</u>	8	10
	Buttons:						
	Sales Receipts	...	114 02				
	Stock on 31-3-1967	...	18 25	132	27		
	Less: Donation from H.H. Maharaja of Nabha	...	56 25				
	Bills Outstanding on 1-4-1966	...	43 68				
1	Stock on 1-4-1966	...	28 17	<u>128</u>	<u>10</u>	4	17
	Lapel Badges:						
	Sales Receipts	...	374 00				
	Bills Outstanding on 31-3-1967	...	280 00	654	00		
	Stock on 31-3-1967	...		273	34		
				<u>927</u>	<u>34</u>		
	Less: Purchases against Loan from H.H. Maharaja of Nabha	...		787	50	139	84
284	Pads and Covers: (Income)	...				—	—
84	Ties: (Income)	...				—	—
816			CARRIED OVER			544	23

WILD LIFE PRESERVATION SOCIETY OF INDIA, DEHRA DUN

ANNEXURE 'B'—(Contd.)

Statement of Accounts of Other Income for the Year ending 31-3-1967

<i>Prev. year</i>		Rs.	P.	Rs.	P.	Rs.	P.
816	BROUGHT FORWARD					544	23
	<i>Less: Loss on sale of:</i>						
	Pads and Covers:						
	Outstanding Bills on 1-4-1966	...	288 00				
	Stock on 1-4-1966	...	105 19	393	19		
	<i>Less: Sales Receipts:</i>	...	217 00				
	For Office Use	...	25 00				
	Sales Returns	...	3 00				
	Outstanding Bills on 31-3-1967	...	8 50				
	Stock on 31-3-1967	...	37 84	291	34	101	85
						442	38
	Ties:						
	Outstanding Bills on 1-4-1966	...	336 00				
	Stock on 1-4-1966	...	140 00				
	Donation from H.H. Maharaja of Nabha	...	288 00	764	00		
	<i>Less: Sales Receipts</i>	...	579 00				
	Stock on 31-3-1967	...	180 00	759	00	5	00
816	Net Income					437	38

Annexed to the Income and Expenditure Account.

15, Rajpur Road, Dehra Dun,
Dated June 8, 1967.

For M/s. P.N. BAHRI & Co., *Chartered Accountants.*
Sd. P.N. BAHRI, Partner, *Chartered Accountant.*

APPLICATION FORM

The Wild Life Preservation Society of India

I, of

hereby apply to be admitted as a Life/Ordinary/Professional/Educational/Family/Affiliated/
Institutional/Student Member of the Wild Life Preservation Society of India.

My interests are.....

Name

Designation.....

Address.....

Date of Birth.....

MEMBERSHIP

- | | |
|---|--|
| 1. Life : | Rs. 150.00 |
| 2. Ordinary : | Rs. 20.00 Entrance Fee + Rs. 12.00 subscription per annum. |
| 3. Professional :
(Foresters, Agricultural Workers,
Soil Conservationists, Wild Life
Managers) | 50% of Ordinary Members. |
| 4. Educational :
(Teachers and Trainers) | 50% of Ordinary Members. |
| 5. Student : | 50% of Ordinary Members. No Entrance Fee. |
| 6. Family :
(Applies to 2, 3 and 4 above) | Twice Ordinary Members. No Entrance Fee. |
| 7. Affiliated :
(Other similar bodies) | |
| 8. Institutional
Messses, Units, Schools, Colleges,
etc.) | Five times the Ordinary Member, i.e., Rs. 60.00 with 5 votes. No Entrance Fee. |

The Wild Life Preservation Society of India

To Members,

There are many people who have the interests of Wild Life Conservation at heart but in these difficult days are not able to do as much for the cause during their lives as they otherwise might.

It is, therefore, considered that a Form of Bequest might appeal. Such a form is, therefore, now inserted in our Journal and the attention of members is respectfully invited.

Any sums received will be wisely expended in measures calculated to conserve wild life.

FORM OF BEQUEST

I give and bequeath the sum of.....unto the Wild Life Preservation Society of India, Dehra Dun and I declare that the receipt of the Honorary Secretary and Treasurer of the said Society shall be sufficient discharge for the said sum.

Signed.....

Address.....

Witness:

Name.....

Address.....

Occupation.....

**Buy from the Honorary Secretary, Wild Life Preservation Society of India
7, Astley, Hall Dehra Dun.**

- (1) Greeting Card in colour with pictures of Peacock, white Tiger and Panther.
Card suitable for all occasions ... Price Re. 0.75 each
- (2) Society's Tie (with Cheetal head in gold on green silk) Rs. 12.00 each
- (3) Society's Blazer Brass Buttons with Cheetal head (small and large) Rs. 12.00 doz.
- (4) Society's Writing Pads & Covers (two pads with 100 covers) Rs. 11.00 each
- (5) Balance of Nature Game (for members) Rs. 6.00 each
- (6) Society's Cheetal Head Lapel Badge Rs. 2.00 each
- (7) Tourists' guide to Sanctuaries & National Parks in India Re. 0.25 each

ADVERTISEMENT TARIFF

Full Page		Price Rs.	65.00
Half Page	...	„ Rs.	35.00
Quarter Page	...	„ Rs.	20.00
Front & Back (Inner Cover)	...	„ Rs.	100.00
Back Cover	...	„ Rs.	150.00

**JOIN THE SOCIETY AND HELP PRESERVE INDIA'S
VANISHING WILD LIFE.**

Postel Address :

7, Astley Hall, Dehra Dun.

EXECUTIVE COMMITTEE

President:—His Highness Maharaja Pratap Singh Malvendra of Nabha—Regional Secretary for North India, Indian Board of Wild Life.

Senior Executive Vice-President:—Shri S.S. Negi (Retd. Conservator of Forests).

Vice-Presidents:—1. Mr. P.D. Stracey.

2. Dr. Baini Prashad.

3. Sardar Ranbir Singh.

4. Mr. R.C. Kaushik.

5. His Highness the Maharaja of Kotah.

Honorary Secretary & Treasurer:—Dr. R.N. Misra.

Asstt. Hony. Secretaries:—1. Dr. S.K. Sangal.

2. Shri Bhagat Singh, Secretary, Wild Life Club, F.R.I. & Colleges, Dehra Dun.

Members:—1. Shri T.S. Negi

2. Sodhi Kartar Singh

3. Shri Tej Bahadur Singh

4. Shri Narendra Singh

5. Brigadier Gambhir Singh

6. Col. C.W. Adams

7. Dr. R.S. Gupta

8. Dr. S.L. Goyal

9. Mr. M.D. Chaturvedi

10. The Secretary, Shikar Club, I.M.A.

11. Shri H.K. Dang

12. Shri N.K. Jain

13. Dr. M.B. Lal

14. Shri R.D. Singh

15. Shri Padam Bahadur Singh

16. Mr. V.J. Binney

17. Raja Bajrang Bahadur Singh
of Bhadri

18. Shri K.S. Srivastava

19. Shri B.N. Chaturvedi, I.F.S.

Ex-Officio Members:—1. The Chief Wild Life Warden, U.P.

2. The Wild Life Warden, Dehra Dun Region.

3. D.F.O., East Dehra Dun Division, Dehra Dun.

4. D.F.O., West Dehra Dun Division, Dehra Dun.

5. D.F.O., Shiwalik Division, Dehra Dun.

6. The District Magistrate, Dehra Dun.

7. The Superintendent of Police, Dehra Dun.

8. The Secretary, Wild Life Club, Doon School, Dehra Dun.

Sub Committees:—1. Wild Life Legislation.

2. Publicity.

3. Education and Propaganda.

4. Fisheries.

Assam Branch (Shillong)

President:—H.H. the Maharaja of Charkhari.

Vice-President:—Mr. E.P. Gee.

Secretary:—Mr. J. Swer.

Bihar Branch (Monghyr)

President:—Kumar Surendra Singh.

Secretary:—Prof. A.A. Khan.

Editorial Board

1. Shri Hari Dang

2. Dr. Baini Prasad

3. Shri S.S. Negi

4. Dr. R.N. Misra

5. Shri M.D. Chaturvedi

6. Shri R.D. Singh

Wild Life Preservation Society of India

I. The aims and objects of the Society are as follows:

- (a) To promote interest in and impart knowledge regarding the preservation and conservation of all forms of wild life, particularly among the youth of the country.
- (b) To co-operate with the Govts. of India and States and with other Societies and Institutions having similar aims and objects in working for the interests of wild life.
- (c) To assist in enforcing and actively supporting the Forest Acts, Wild Birds and Animals Protection Acts and Rules etc. of States and the Indian Arms Act and Rules in so far as they pertain to wild life and to bring to the notice of the authorities any infringement of the same and to assist in the detection and prosecution of offenders in respect of such laws.
- (d) To advise and help the Govt. and wild life administrators in the formation, maintenance and protection of Sanctuaries and National Parks, the preservation of wild life in general and rare species of India in particular and in the introduction of exotic species into the country, the rehabilitation of rare species etc. and in the revision on rational lines of the shooting and fishing rules, so as to conserve and increase wild life stocks.
- (e) To raise funds for the carrying out of the above aims and objects and to found and maintain museums, reading rooms and libraries of natural history in order to disseminate knowledge regarding wild life.
- (f) To promote sportsmanship in shikar and to recognise well regulated shooting and fishing, as a means of preserving wild life and fish so that through wise use the surplus may provide a recreational asset to the nation.
- (g) To carry out publicity and propaganda for the preservation of wild life in India by means of monographs, journals, films, film strips and other feasible methods.
- (h) To assist members of the Society in obtaining shooting and fishing facilities and facilities for viewing and photographing wild life in India.
- (i) To conduct research into the problem of Wild Life management in India, and in pursuance of this, to initiate, encourage and, where possible, assist in projects for the study of threatened species and related subjects and to provide reference and research facilities for such work.
- (j) To carry on such other activities which will serve the above objects.

What membership of Wild Life Preservation Society of India will entitle you to ?

1. You will become an active member of the growing number of Wild Life enthusiasts, who enjoy working for and spreading the knowledge of how to conserve India's heritage of Wild Life for posterity.
2. You will be entitled to the full use of the Library of the Wild Life Preservation Society and of its reading room.
3. You will receive a membership certificate.
4. You will receive a personal Identification and Membership card.
5. You will be entitled to buy all publications of the Society at a concession rate.
6. You will be entitled to buy at concession rates the Societys' Greeting Cards, Calendars, Tie and the Balance of Nature Game (specially Published in colour for its educative and recreational value).
7. You will be supplied "Cheetal", the Half Yearly journal of the Society free.

THE SYMBOL OF SECURITY



INDIAN TRADE & GENERAL INSURANCE
COMPANY LIMITED

Regd. Office :
**25, Brabourne Road,
Calcutta.**

Principal Office:
**155, Mahatma Gandhi Rd.,
Bombay.**

BRANCHES THROUGHOUT INDIA AND ABROAD